FEB 15 1926

AMERICAN JOURNAL OF SURGERY

A Monthly Chronicle for the Surgeon and General Practitioner

Including the Official TRANSACTIONS of the SECTION OF SURGERY, NEW YORK ACADEMY OF MEDICINE.

WALTER M. BRICKNER, B.S., M.D., F.A.C.S., New York
Editor

with a QUARTERLY SUPPLEMENT *of* ANESTHESIA *and* ANALGESIA
F. HOEFFER McMECHAN, A.M., M.D., Avon Lake, Ohio
Editor.

PUBLISHED BY SURGERY PUBLISHING CO.
ESTABLISHED 1905 BY J. MACDONALD, JR., M.D.
Administrative and Editorial Office: 15 East 26th St., New York, N. Y.

Copyright 1926, by Surgery Publishing Company. Entered as second class matter, April 4, 1921, at the Post Office at Elmira, N. Y., under the Act of March 23, 1879. Publication Office: Elmira, N. Y.
SUBSCRIPTION, TWO DOLLARS PER YEAR FOREIGN, TWELVE SHILLINGS

VOL. XL. FEBRUARY, 1926 No. 2

CONTENTS

Intracranial Hemorrhage in the Newborn. William Sharpe, New York City ---------- 17

The Posterior Ethmoid Cells and the Sphenoid Sinus in Relation to Affections of the Optic Nerve. Harold Hays, New York City ---------- 22

Remarks on Cancer of the Rectum. Jerome M. Lynch, New York City ---------- 25

Compression Paralysis of the Long Thoracic Nerve Following an Abdominal Operation. Max Thorek, Chicago ---------- 26

Sub'uxation of the Shoulder. Chronic Sub'uxation of the Medio-Tarsal Joint. Osteochondromatos's of the Elbow. A Report of Cases. Samuel Kleinberg, New York City ----- 28

TRANSACTIONS OF THE SECTION OF SURGERY, NEW YORK ACADEMY OF MEDICINE

MEETING OF MARCH 6, 1925.

The Relation of Trauma to Malignant Tumors. James Ewing ---------- 30
Discussion by Drs. Farr, Healy, LeWald and Ewing.

Laceration of Flexor Tendon and Ulnar Nerve Sutured with Silk—Not Immobilized—Six Months Post-Operative. William C. White ----- 36
Discussion by Drs. Farr, Murray, Gerster, McCreery, Ramsdell and Beekman.

Anterior Dislocation of the Left Hip With Transverse Fracture of the Middle Third of the Left Femur. William C. White ---------- 37

Compound Fracture of the Ankle. Clay Ray Murray ---------- 37

Spontaneous Sloughing of Gallbladder after Cholecystostomy. Clay Ray Murray ---------- 37

An Electric Cable-Driven Bone Instrument. John J. Moorhead ------- 37

MEETING OF APRIL 3, 1925.

Cholecystectomy and Appendectomy; Pulmonary Emboli. Louis Carp 38
Discussion by Drs. Erdmann and Carp.

Staphylococcus Aureus Sepsis. Osteomyelitis of Femur, Radius and Mandible. Louis Carp ---------- 38
Discussion by Drs. Morris, Beer and Carp.

(*Continued on page 3, Ad. Section*)

Comforting the Patient in Scarlet Fever, Measles, Chicken Pox, etc.

JOHNSON & JOHNSON,
New Brunswick, N. J., U. S. A.
Gentlemen:—I am interested in receiving, without obligation, samples and literature concerning the following:

1. SYNOL LIQUID SOAP for my own use and for sponging bedridden patients.
2. K-Y LUBRICATING JELLY for "stopping the itching without greasing the linen" in scarlet fever, measles, chicken pox, etc.
3. K-Y ANALGESIC for sickbed and convalescent patients to relieve tired, aching heads.

.....
M. D.
.....
STREET
.....
CITY STATE
.....
.....
NAME OF DRUGGIST

Mail this Coupon now to Johnson & Johnson, New Brunswick, N. J.

PARKE, DAVIS AND COMPANY

MERCUROSAL

A Non-Irritating Spirocheticide

MERCURY given in doses which fail to kill the spirochetes of syphilis may be and doubtless is of service, but it is subcurative. Should the inorganic salts of mercury be administered in doses sufficiently large to kill the spirochetes, they would undoubtedly produce serious injury to the kidneys. What the profession has long been looking for is a mercurial that is positively spirocheticidal in doses that will not disturb the kidneys. Mercurosal is such a product. Intravenously administered it accomplishes this result.

Mercurosal is an organic synthetic preparation of mercury, freely soluble in water and having no coagulating effect on blood serum. The intravenous method of administering Mercurosal is painless and does not injure the vein.

Its spirocheticidal effectiveness has been amply proved by scientific investigation. Dr. O. M. Gruhzit, in the *Archives of Dermatology and Syphilology* for April, 1925, reports that the syphilitic lesions in rabbits utilized in his tests were cleaned up by a single intravenous injection of 10 to 15 milligrams of Mercurosal per kilo of body weight; that a dose of 5 milligrams per kilo had the same effect in an average of less than three injections in four days; and that a dose of 3.0 to 3.5 milligrams per kilo rendered the lesion spirochete free in 7½ days, on an average, with three doses.

At the rate of 3 milligrams per kilo of body weight, the dose for a patient weighing 68 kilos (150 lbs.) would be approximately 0.2 gram, to be administered at three-day intervals for twelve to fifteen injections. Treatment should be begun with small doses, to determine the susceptibility of the patient toward mercury. If no hypersensitiveness develops, subsequent injections may be rapidly increased until 0.2 gram is being administered at a single dose.

Mercurosal is being used by an increasing number of syphilologists because of its low toxicity, high mercury content, and efficiency as a spirocheticide.

Mercurosal is supplied in ampoules, each containing 0.1 gram in 5-cc of diluent and in 50-cc vials, each cubic centimeter of which contains 0.025 gram. Of this solution, 8 cc will, of course, contain 0.2 gram Mercurosal. The product is also furnished in powder form in tubes containing 0.1 gram and 0.05 gram respectively, the marketed packages being boxes of 12 tubes.

Write for booklet on Mercurosal. A postal card will bring it by return mail.

PARKE, DAVIS & COMPANY

DETROIT, MICHIGAN

MERCUROSAL IS INCLUDED IN N. N. R. BY THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION

AMERICAN
JOURNAL OF SURGERY

VOL. XL. FEBRUARY, 1926 No. 2

INTRACRANIAL HEMORRHAGE IN THE NEWBORN*

WILLIAM SHARPE, M.D.
Professor of Neuro-Surgery, New York Polyclinic Hospital and Postgraduate Medical School
NEW YORK CITY.

The condition of intracranial hemorrhage in the newborn has been studied as a chronic condition, as an end-result, rather than being recognized in the acute stage within the first ten days after birth. It has been this lack of recognition of the condition as an acute lesion at the time of children surviving, of the varying degrees of of birth and then the development later in the mental and physical impairment as a chronic condition, that have permitted much confusion to arise regarding the etiology of the majority of the cases of cerebral spastic paralysis with and without marked mental retardation.

For many years, it has been recognized by obstetricians that severe intracranial injuries of the newborn could occur at the time of birth, particularly with difficult prolonged labor and especially with the use of instruments of the type known as "high forceps", and when death did occur and the actual intracranial lesion of extensive hemorrhage was demonstrated at autopsy, the opinion could be expressed that it was fortunate — both for the relatives and for the child itself, that death intervened and spared all those concerned—including the taxable community with its overflowing state institutions. These extreme moribund cases of acute intracranial hemorrhage in the newborn are usually recognized, but most unfortunately, it is the more common and milder cases in which the intracranial hemorrhage is less extensive and rarely diagnosed that so frequently survive so far as life is concerned, only to develop later the definite physical impairments and mental retardation so characteristic of this pitiful group of patients—the bane of the neurologist, pediatrist, orthopedist and the general practitioner himself.

The acute condition at birth not being recognized and often not even suspected, naturally the later development of the chronic condition is usually ascribed, *not* to a birth trauma but rather to an obscure lack of development, an earlier meningo-encephalitis, tained heredity, lues, cranial trauma during the years of infancy, etc., etc., —all possible causes and factors in the diagnosis of the chronic condition and yet not the most common cause, an intracranial hemorrhage at the time of birth. It is with these etiological factors in mind, that I desire to indicate very briefly the development of medical knowledge regarding this rather common chronic condition and then to present some recent impressions of the acute condition in a large series of newborn babies.

Although the condition of extensive intracranial hemorrhage in the newborn had been occasionally mentioned in the literature, the chronic condition in the patients surviving from the milder forms of the acute lesion was rarely if ever diagnosed; during the period of 1826 to 1835, Denis, Billard and Cruveilhier published in Paris several papers intimating and suggesting the causal relationship of intracranial hemorrhage at birth and the later development of cerebral spastic paralysis. Mr. W. J. Little of London, in 1843, in his first monograph upon cerebral spastic paralysis in children, or the now so-called Little's Disease, entitled "Deformities of the Human Frame",[2] stated that the condition was due to an impairment of nerve tissues resulting from their lack of development, and also to an earlier meningitis. A few cases following difficult labor were, in his opinion, the result of intracranial hemorrhage at birth. But it is most interesting to note that in his second monograph upon cerebral spastic paralysis, published in 1862 (just nineteen years later), and entitled "On the Influence of Abnormal Parturition, Difficult Labors, etc., upon the Mental and Physical Condition of the Child",[1] he stated that, in his opinion, almost 75% of these cases were the result of an intracranial hemorrhage at the time of birth. Unfortunately, however, these later observations of Mr. Little regarding the great frequency of intracranial hemorrhage as the chief cause of the chronic condition of cerebral spastic paralysis with the varying degrees of mental retardation, have been overlooked or misinterpreted by the medical profession so that, at present, the diagnosis of Little's Disease ordinarily implies either a lack of development of cerebral tissues of unknown origin or a destructive process due to an earlier meningo-encephalitis, with the etiologic factors of heredity and of lues being common

*Read before the New York Physicians Association, November, 1925.

ones; and rarely is this chronic condition in children ascribed to a probable intracranial hemorrhage occurring at the time of birth and of not sufficient amount to cause the early death of the child. The severe acute lesions of intracranial hemorrhage in the newborn are usually recognized within the first week after birth, especially if the baby dies; but if the baby survives this acute condition, by the absorption of a large amount of the hemorrhage, the clinical signs of the intracranial lesion quickly disappear within the first month after birth—if indeed, the signs have been definite enough to be recognized at all as indicating a serious intracranial lesion. The baby may thus be considered normal until months later when it is noticed that the child is not beginning to hold up its head, is not sitting up when it should be attempting to do so and that there is developing a stiffness and spasticity of the extremities of various types and degrees—of one leg or of both legs, so that they remain crossed in adduction, and of one arm or of both arms so that they become flexed with the hand clenched, the thumb being strongly adducted to the palm and beneath the clenched fingers—the typical clinical picture of early cerebral spastic paralysis of the hemiplegic, diplegic and paraplegic types; the associated mental impairment is frequently indicated grossly by a retardation of speech for months after the usual time. These later chronic cases who so often have passed from the observation of their attending obstetrician (if, indeed, there was any marked and recognized clinical evidence of an intracranial hemorrhage within the first two weeks after birth) are variously diagnosed. They are called Little's disease, to be sure, but as to its cause, rarely has the diagnosis in these chronic cases been the definite one of an intracranial hemorrhage at the time of birth.

In 1885, Sarah McNutt confirmed by careful pathological studies the opinion of Little that almost 75% of the chronic cases of cerebral spastic paralysis were due to hemorrhage. More recently, Beneke in 1910, Pott in 1911, Mayer in 1915, Holland in 1920, and within the past four years Schafer, Schwartz, Saenger and Capon and others have contributed valuable post-mortem observations and yet the literature of the clinical observations has been most meager. In this country, Green, Brady, Sidbury, Warwick, Rodda and Huenekens have all added to the knowledge of the subject during the past decade, and the present paper is a similar effort to facilitate the early diagnosis and thus make possible the *early* rational treatment of the condition.

During the ten year period of 1913 to 1923, I had the opportunity of examining personally 5192 children having the various forms of cerebral spastic paralysis with and without marked mental impairment; the age of these chronic patients (over one month of age) ranged from 34 days to 20 years. In this series of chronic cases, in only 671 (12+%) was there found definite evidence of an increased intracranial pressure to the degree of producing fundal changes observable with the ophthalmoscope* and of being accurately measured by the spinal mercurial manometer at lumbar puncture. By these two modern tests, and especially the latter, it has been possible to differentiate to a very large degree those patients having a definite increase of the intracranial pressure (only 12% in this series)—and therefore the ones that may be benefitted by a lowering of this pressure either by medicine (thyroid and thymus therapy) or by the cranial operation of decompression and drainage[3]—from those other patients (88% in this series) not having a demonstrable increased intracranial pressure and therefore to whom little if anything, other than orthopedic measures, such as tendon lengthenings, muscle transplantations, the various peripheral nerve operations and the more recent sympathetic ramisectomies can be offered, a permanent cerebral damage having already occurred. Of these 671 chronic patients having a definite increase of the intracranial pressure, 604 had a subtemporal decompression with drainage of the partially blocked cerebrospinal fluid and in all of them, with the exception of 19 cases, the pathologic process has been practically the same—edematous ("wet") brains under varying degrees of increased intracranial pressure, and along the thickened walls of the supracortical veins in the sulci could be observed a whitish cloudy new tissue formation—the organization residue of a former layer of supracortical hemorrhage. Since it has now been conclusively demonstrated that almost 80% of the cerebrospinal fluid is excreted normally through the walls of the supracortical veins into the blood stream and only the remain-

*In not one of these patients has the intracranial pressure been so high as to produce the so-called "choked disks," (a measurable papilledema of 2D plus), but only those fundal changes indicative of a milder degree of increased intracranial pressure—a dilatation of the retinal veins, edematous obscuration of the disk margins especially upon the nasal side and frequently of the nasal halves of the disks themselves. Whether these fundal changes in the individual cases are within normal physiological limits may be ascertained by the more delicate and accurate test of a measurement of the pressure of the cerebrospinal fluid at lumbar puncture as registered by the spinal mercurial manometer. It is an interesting observation in this connection that "choked disks" are only occasionally found in the acute traumatic cases of adults—apparently in only those patients having a large slowly forming extradural hemorrhage of the middle meningeal artery and thus gradually producing an extreme intracranial pressure as of tumor formation; in the more common extensive and rapidly forming subdural hemorrhage, on the contrary, the resulting sudden rise of the intracranial pressure apparently precipitates an early medullary edema and the death of the patient even before the high intracranial pressure can produce a measurable papilledema. In only 9 patients in a series of over 600 acute brain injuries in adults has the condition of "choked disks" been observed.

ing 20% by means of the sinuses, Pacchionian bodies, etc., and *not* almost entirely by the latter as had been believed and taught, these operative and post-mortem findings of organized new tissue formation about the supracortical veins explain the partial blockage of the stomata of exit of the cerebrospinal fluid and thus the edematous swollen brain associated with a resulting increased intracranial pressure of varying degree according to the amount of blockage. (The blockage resulting from a former meningeal exudate is much more extensive and complete—producing the various degrees of so-called external hydrocephalus and if the acqueduct or the foramina of Majendie and Luschka should be occluded, then the ventricular dilatation of internal hydrocephalus).

Most instructive have been the histories of the labor and of the first week after birth of these chronic cases of cerebral spastic paralysis, with and without marked mental retardation, with the subsequent operative and post-mortem findings* of an organic partial blockage of the excretion of the cerebrospinal fluid producing the increased intracranial pressure of chronic cerebral edema.[4] Eighty-one per cent. have been first children; 72% have been males; 95% have been full-term babies; in 90% the labor has been prolonged and difficult, forceps having been applied in 76% of them—although in a large percentage of these cases more as a last resort rather than as an early application; in 17%, it has been from a breech presentation. Pituitrin was reported as having been used in 8% of these cases. During the first week after birth, 64% of these children were considered more drowsy and stuporous than normal, 23% refusing to nurse and 73% not evincing the normal demand for food; 39% had muscular twitchings of varying degree, particularly of the orbital muscles and of either leg or hand; in 17%, general convulsive seizures occurred one or more times during the first two weeks. An icteroid appearance was noted in 18%. Within two weeks after birth, 61% of these children were called "well" and "normal," (if anything serious had been suspected at all), and in 82% of them, within one month after birth, the child was "to all appearances" normal in every way. With the exception of 21%, it was only in the later months of the first year that it was observed that the child was not beginning to hold up its head and then to sit up when it normally should do so and in 79%, the beginning of spasticity of the legs or arms was not demonstrable before the seventh month. The later history of not walking and talking within the normal age limits varied by months and even years—a small percentage never having walked or talked. Wassermann test of the cerebrospinal fluid was positive in only 0.5% of all the cases.

During this same period of 1913 to January 1, 1923, I had the opportunity of examining in consultation and treating personally 46 newborn babies within the first two weeks—the diagnosis being a serious intracranial lesion, most probably hemorrhage, following very difficult labor with and without the use of instruments. The acute condition of these children was considered of such grave character that early death was feared and it was hoped that possibly a cranial operation might offer the child a chance of recovery of life at least. Lumbar puncture was performed upon all but two—these two having died before the test could be performed, and free blood under varying degrees of increased pressure was found in the cerebrospinal fluid of 87% of those patients tested during the first week after birth; during the second week, and especially later, the lumbar puncture becomes increasingly less valuable as a diagnostic aid—the blood usually coagulating within the first ten days. Repeated lumbar punctures of spinal drainage were used in four of the milder and earlier cases within the first week in the hope that the intracranial hemorrhage could be drained in this simple manner, but in only two of them, after 4 and 7 lumbar punctures respectively every 12 hours, did the fluid become clear and of normal pressure. (This method of spinal drainage should be attempted in all but the very extreme cases of extensive intracranial hemorrhage under high pressure, within the first week after birth; if then the cerebrospinal fluid does not become clear or the pressure become normal and remain normal, the cranial operation of modified subtemporal decompression and drainage should be considered.) The operative and post-mortem findings in 100% of these extreme acute cases disclosed subdural, supracortical and subarachnoid hemorrhage of varying degree.

During the past three years, it was becoming more and more impressed upon me that these *extreme* acute cases of extensive intracranial hemorrhage of the newborn to the degree of producing profound unconsciousness, inability to nurse

* During the past ten years I have insisted, before performing an operation upon any patient having a chronic neurologic condition, that the nearest relatives give me, in writing, permission to make a post-mortem examination, in case the patient should die (and naturally one does not expect the patient to die), in order to ascertain the real cause of death rather than accept the common report of "shock", "cerebral or pulmonary embolus" and "thrombus formation." If death is due to an operative error or to some avoidable complication, then it is for the surgeon to realize it so that its repetition can, if possible, be prevented in future patients; moreover the accuracy of the diagnosis is thus confirmed or disproved and the pathologic lesion is carefully examined. The co-operation of the nearest relative in permitting these examinations has been the rule; in only three cases in a series of over 1200 patients operated upon was a flat refusal maintained—and no operation was performed.

and even convulsive seizures, were almost the only ones being recognized by the obstetrician with any degree of certainty. The cases of milder degree and of less extensive intracranial hemorrhage at the time of birth do not produce marked clinical signs of its presence because the cerebral cortex at this early age is not highly developed, the newborn child being more of a spinal than cerebral animal. Also, the histories of the chronic cases of cerebral spastic paralysis were very suggestive in that the large majority of them were first-born, full-term associated with difficult labor with and without the use of instruments and in whom the clinical signs, even when observed, were often not more marked than by a slight drowsiness, difficulty in nursing and an occasional muscular twitching, regarded as "nothing at all" or as a condition that would all "clear up." Fortunately, in the mild cases of small hemorrhage and frequently not associated with any definite clinical signs at all, the natural means of absorption were undoubtedly often sufficient to "take care of" the hemorrhage so that no supracortical residue of organized new tissue formation of the layer of clot remained to block the normal absorption of the cerebrospinal fluid, and these patients became normal and remained so. But unfortunately, in those cases of more extensive hemorrhage and in which the clinical signs during the first ten days after birth were usually noted, as (mild stupor, difficulty in nursing and occasional muscular twitching) the condition usually did "clear up" within the first two weeks and one month, but only temporarily so. After a period of several months of apparent normality, these children began to exhibit within the first year and also the second year, the definite signs of physical impairment and mental retardation—the typical condition of cerebral spastic paralysis. Naturally, this later development of a chronic condition in an apparently normal child was a most puzzling one and has been ascribed to numerous causes—lack of development, a former meningo-encephalitis, lues, heredity, etc.

Realizing that the ideal time for treatment of this traumatic condition of the newborn, just as in the cases of traumatic intracranial hemorrhage in adults with and without a fracture of the skull, is during the acute stage; i. e., during the first week when the hemorrhage can be drained in fluid form. Suspecting that intracranial hemorrhage was occurring in the newborn much more commonly than had been conceived owing to the paucity or lack of symptoms and signs at birth, I obtained permission in January, 1923, for performing a series of lumbar punctures upon consecutive newborn children at the City Hospital, Welfare Island, New York, through the courtesy of Doctors Wilbur Ward, F. A. Dorman, and C. G. Child, Jr., upon whose services the following observations have been recorded in five hundred consecutive newborn babies. I am deeply indebted to my associate, Doctor A. S. Maclaire, who performed 400 of the lumbar punctures in this series of 500 patients, registering the pressure and examining the cerebrospinal fluid; and who made blood coagulation tests upon those children in whom an intracranial hemorrhage of varying degree had occurred.

1st Series—9% had hemorrhagic cerebrospinal fluid.

Impressions:—Acute intracranial hemorrhage and cerebral edema of varying amounts in the newborn occur rather frequently. The simple method of lumbar puncture within the first week after birth may be used to demonstrate the presence or absence of free blood in the cerebrospinal fluid. If present, the natural means of its absorption can be aided by repeated lumbar punctures. If not present, an intracranial hemorrhage lesion can be practically excluded. The mildness and almost lack of clinical symptoms and signs, even in the presence of extensive intracranial hemorrhage and cerebral edema in the newborn, emphasize the advisability and importance of an early lumbar puncture, both as a diagnostic and as a therapeutic measure, in any suspected case of intracranial lesion in the newborn, irrespective of the type of labor. This early recognition of an intracranial hemorrhage in the newborn and the appropriate treatment will thus tend to reduce that large chronic group of physically impaired and mentally retarded children.

2nd Series—13% had hemorrhagic cerebrospinal fluid.

Impressions:—Intracranial hemorrhage in the newborn occurs more frequently than formerly suspected—the acute cases with mild signs or no recognized signs at all being overlooked. Hemorrhage disease of the newborn does not appear to be an important etiological factor. Instrumental delivery becomes a causative factor when the application is a late and difficult one—where it is a medium—or, especially, a high—rather than a low-forceps early application. Early lumbar puncture is advocated as a safe routine procedure in suspected cases having the milder signs of intracranial hemorrhage and cerebral edema.

3rd Series—10% had hemorrhagic cerebrospinal fluid.

Impressions:—Early lumbar puncture should be employed in cases of suspected intracranial hemorrhage in the newborn, in the absence of shock, not only for its diagnostic but also for its thera-

peutic value. Repeated lumbar punctures of spinal drainage (every 12-24 hours) are indicated according to the increased intracranial pressure of hemorrhage and cerebral edema. Yellow spinal fluid in the newborn is most probably the result of transudation of the blood plasma when red blood corpuscles are absent (the hemoglobin not being demonstrated by the guaiac test) and due to minute hemorrhage when red blood corpuscles are present.

4th Series—7% had hemorrhagic cerebrospinal fluid.

Impressions:—Acute intracranial hemorrhage and cerebral edema of varying amounts occur more frequently in the newborn than formally suspected. Unless the hemorrhage is of large amount, the usual signs of intracranial hemorrhage in the newborn are meager (drowsiness, difficulty in nursing and slight muscular twitchings) and even may be apparently absent. At present, early lumbar puncture is the only accurate means of early diagnosis and especially in the mild and so-called signless cases. The therapeutic lumbar punctures of spinal drainage should be repeated as frequently as the severity of the intracranial hemorrhage warrants—every 6, 12, 24 hours, and even more frequently. Babies of low vitality, and especially if premature, or babies in a state of shock should not be punctured even in the presence of signs of an intracranial hemorrhage, until the general condition improves. (This is true of brain injuries in adults as well as in the newborn—the treatment should be directed to the general condition of shock rather than to the local intracranial condition; if the patient is unable to survive the shock, examination or tests will not aid, but will increase the shock). Muscular twitches of fingers, extremities, face and orbits are very suggestive as signs of increased cerebral irritability due to supracortical hemorrhage or cerebral edema. The use of early and correctly applied forceps, especially low forceps, does not increase the danger of intracranial hemorrhage; but in prolonged labor, causing extreme intracranial venous stasis, and especially when instruments are used as a last resort, the danger of intracranial hemorrhage is greatly increased. Hemorrhagic disease of the newborn does not appear to be an important etiological factor. Early lumbar puncture as a diagnostic and therapeutic aid is not advocated as a routine procedure, but only in doubtful and suspected cases of intracranial hemorrhage. By it early recognition at the ideal time for treatment should permit the greatest possible recovery, both of life and of future normality, and in this manner, that large group of physically and mentally impaired children having the chronic condition of cerebral spastic paralysis with varying degrees of mental retardation may thus be lessened.

5th Series—6% had hemorrhagic cerebrospinal fluid.

Impressions:—In this series, as in the preceding four series, it was very surprising not to have found a lengthened coagulation-time of the blood—at least in several of the 45 cases that had bloody cerebrospinal fluid in the total series of 500 newborn babies. The Rodda method was used and although the bleeding time might still be lengthened and yet the coagulation-time apparently be within normal limits, the great importance formally ascribed to hemorrhagic disease of the newborn as *the* etiological factor in intracranial hemorrhage seems unwarranted—at least in these series of observations. Two of the 6 babies having bloody cerebrospinal fluid in this series were premature and, as in the preceding four series, it does seem that these premature babies are more liable to intracranial hemorrhage than are the ones born at full term. Whether this is due in part to the walls of their supracortical veins not being sufficiently developed and therefore not so resistant to the dilatation and venous congestion associated with birth and therefore rupturing more easily, can only be surmised as a possible explanation. Breech extraction in this series is again a frequent cause of intracranial hemorrhage, and prolonged labor with and without last resort low forceps application is also a definite etiological factor.

In the preceding series, the male and female infants were of equal number, and the mothers were primiparae in about one-half of the cases. In this series, however, only 39 were first children and 44 were negroes. These factors may account for the lessened incidence of bloody cerebrospinal fluid in this series as compared with 9%, 13%, 10% and 7% in the four preceding series, respectively.

The clinical signs have been most meager and if a routine lumbar puncture had not been performed, it is doubtful whether the condition of intracranial hemorrhage could have been even suspected in many of the cases. Difficulty in nursing and prolonged drowsiness were the two most common signs. Only 4 lumbar punctures of spinal drainage were necessary in this series to obtain clear cerebrospinal fluid, as compared with 7, 8 and even 9 punctures in three cases of the preceding series. Possibly the free blood as disclosed by lumbar puncture would have been entirely absorbed by the natural means through the stomata of exit in the walls of the supracortical veins. Yet it seems rational to presume that the additional spinal drainage of repeated lumbar punctures aids in the complete absorption of

the free blood which might be in an amount too large to be entirely absorbed by the natural means. The added risk of a lumbar puncture appears to have been practically nil in the babies of these series of observations, but naturally in babies of low vitality and especially if premature, or babies in the state of severe shock, no lumbar puncture should be performed nor indeed any prolonged examinations or operation that might increase the shock. These patients in shock having intracranial hemorrhage of the usual type (supracortical venous bleeding) cannot continue bleeding intracranially to any large amount, because very quickly the increased intracranial pressure will become greater than the lowered general arterial blood pressure of shock and the intracranial hemorrhage lessens; as the baby recovers from the acute condition of shock, the general arterial blood pressure rises so that it again becomes possible for intracranial venous hemorrhage to occur, unless coagulation of the blood of the ruptured supracortical veins is sufficient to prevent continued venous oozing. In this connection, the use of blood coagulants, such as calcium lactate, mother's blood, hemostatic sera, etc., may be of value to increase the coagulability of the blood even if the coagulation-time is normal. But treatment by increasing the coagulability of the blood should be combined with drainage from the cerebrospinal system of the blood already escaped from the ruptured vessels.

And in the rare extreme cases even the cranial drainage of modified subtemporal decompression is justified. Naturally, the earlier the true intracranial condition is recognized and its appropriate treatment instituted while the blood is still in fluid form, just so much better is the prognosis both as to life and to future normality. Theoretically, the use of blood coagulants alone in the treatment might in certain cases of large hemorrhage produce a too rapid coagulation of the blood already escaped from the supracortical veins and lying upon the cerebral cortex, so that this blood clot could be less easily absorbed by the natural means thus defeating in part the object of the treatment. For this consideration, too, treatment should be a combined one—increasing blood coagulation and early draining the blood while it is fluid, both removing the free blood from the cerebrospinal system and at the same time diluting the blood consistency of the cerebrospinal fluid, so that this free blood clots less rapidly and is more readily absorbed.

REFERENCES

1. *The Lancet*, vol. I, p. 350 (December 16, 1843).
2. *Obstetrical Transactions*, vol. 3, p. 293 (1862).
3. *J. A. M. A.*, May 13, 1916; *also, Proc. of Amer. Assn. for Feeble-Minded*, 1918.
4. The Condition of Traumatic Cerebral Edema. *Amer. J. Med. Sci.* 165, p. 405, March, 1923.

20 WEST 50TH STREET.

THE POSTERIOR ETHMOID CELLS AND THE SPHENOID SINUS IN RELATION TO AFFECTIONS OF THE OPTIC NERVE

HAROLD HAYS, M.D., F.A.C.S.,
NEW YORK CITY

Within the past decade White of Boston, Skillern of Philadelphia and others have convinced the rhinologist that a lesion of the optic nerve may result from an inflammation or infection of the posterior ethmoid cells or sphenoid sinus which may not be evident on the most minute examination of the nasal cavities. Even most careful *x*-ray pictures often will not throw any light on this relationship. How is one to decide that an optic or a retrobulbar neuritis is caused by some trouble in the accessory sinuses? The rhinologist can not decide such a question. The decision must rest with the ophthalmologist who has ruled out every other etiological factor and who then insists that the seat of the trouble is in the posterior ethmoid cells or in the sphenoid or both. It is presumed that his experience has shown him that, on both pathological and clinical evidence, pressure can be exerted on the optic nerve or that a disturbance in the circulation within the blood vessels in the nerve, can take place from a diseased condition of the sinuses which is demonstrable at the time of operation. The following case is illustrative:

A patient of mine consulted Dr. Charles H. May of New York for what she thought required a change of glasses. Examination of the fundi showed plainly that she had a beginning thrombosis of the retinal veins of the left eye. Dr. May warned her of the possible seriousness of the condition and insisted on an immediate examination of her teeth, nose and throat. A diseased condition of the teeth was at once ruled out. Examination of her throat showed small, moderately diseased tonsils. Examination of her nose and sinuses showed a very interesting condition. On shrinking the mucosa with a mild cocain and adrenalin solution, it was evident that there was a difference in the condition of the middle turbinates. The mucosa over the middle turbinate bone on the right side shrunk down appreciably; while on the other side there was hardly any shrinkage at all. An *x*-ray picture taken that same day showed a clouding of the left antrum but no affection of the ethmoid cells or sphenoid sinuses. However, with the evidence I have cited above, I insisted upon immediate operation. The left ethmoid cells were exenterated and the sphenoid sinus opened up. More minute examination of the removed specimen showed a thrombosis of all the veins of the ethmoid labyrinth. The patient left the hospital on the third day after operation and, in the course of time, her eye condition cleared up.

Of course, in this case one might say that there was some clinical evidence within the nose. Yet I venture to insist that, if the eye examination had not been made, the nasal condition never would have been suspected.

PRACTICAL ANATOMY

It will not be my purpose to describe the minute anatomy of these parts but merely to point

out some practical facts. The sphenoid sinuses, lying at the base of the skull, may vary considerably in size, texture and placement. One cell may be larger than the other and the septum between the two may be so far over to one side that the optic foramina may be in direct relationship with one sinus only. The opening of the sinus is in direct connection with the posterior ethmoidal cells. In fact, the posterior ethmoidal cell may be immediately continuous with the sphenoid sinus so that they form one cell. One can readily see from the above the possibility of error both in diagnosis and in operative results. However, we are mainly concerned with the relationship of these sinuses to the optic nerve. How may this nerve become affected from a diseased condition within the sinus? This may occur in many ways. If one will hold a dried skull up to the light, he will see that the plate of normal bone which separates the sphenoid sinus from the optic nerve is only a few microns in thickness. Pressure may therefore be exerted by an erosion of this thin plate of bone forced toward the nerve by fluid within the sphenoid sinus. An inflammatory condition of the mucosa of the sinus may also influence the nerve, or granulation tissue in the sinus may itself cause pressure on this thin plate of bone. But, of far more interest, is the relationship of the blood supply of these parts. Apparently, either through diploic veins or larger vessels too numerous to mention here, the optic nerve and the posterior sinuses of the nose have the same source of blood supply. Therefore any inflammation of these parts, giving rise to a hyperplastic condition of the mucosa which would not even be evident on minute examination, will cause an alteration in the circulation in the optic nerve, resulting in optic neuritis, retrobulbar neuritis or optic atrophy. This is evidenced in the following case:

About five years ago, I saw in consultation, Miss M., a woman of twenty years. About four weeks before the onset of her symptoms, she injured her back by falling down a flight of stairs. Nothing occurred until she noticed that her sight was defective and, within a short time, she became totally blind. During the following three weeks, she was examined by a number of physicians but no one could determine the cause of the trouble. X-ray pictures of her sinuses were negative. My examination of her nose and nasal sinuses was also negative but I insisted because of my previous experience with eye cases, that all the sinuses should at once be opened up and drained. The operation was performed that same evening. Within four days, her sight began to come back in the left eye and within a month, she was able to see in both eyes. At the end of four months, her sight was perfectly normal.

Here was a case of retrobulbar neuritis with no accountable cause. I do not believe that the accident which preceded her trouble had anything to do with the subsequent events except, perhaps to cause a disturbance of circulation. At operation, no pus was found. The mucosa of the middle turbinates was hyperplastic. None of the paranasal cavities contained even a small amount of serum.

Although the *x*-ray picture may be of little value in determining any lesion, yet it has its value in informing us as to the size of the sinuses, their position and any abnormalities, such as a misplaced septum between the sphenoids. It will also give an indication of the extension of the ethmoid cells beyond the normal planes. We have been taught that the ethmoid cells lie between the central plate and the external bounding wall composed of the lacrimal bone, the nasal process of the superior maxillary bone, etc. But examination of many skulls will show considerable variation such as the extension of ethmoid cells outward to the temporal region. Such variation in anatomy must be taken into account when one is operating upon these parts, particularly if it is to cure some condition external to the nose.

Symptoms

A diagnosis of a condition of the paranasal sinuses will depend upon a correlation of symptoms that occur both within and without the nose. If there is a definite pathologic condition within the nasal cavities evidenced by nasal obstruction, neuralgic pains in various parts of the head, discharge from the nose, etc., the diagnosis is easy. This is especially so when the clinical evidence is supported by the *x*-ray picture. But what symptoms are we to look for to determine that these sinuses are diseased when our nasal examination is practically negative? An example will be found in the following case:

Miss L. consulted me a short time ago complaining of pain deep behind the eyes and radiating over the temporal regions. Examination of her nose and sinuses was practically negative. I advised her to have her eyes examined. The report from the ophthalmologist showed that there was a marked contraction of both visual fields. The fundi were normal. It had been my experience to note such a contraction in connection with a hyperplastic condition of the sinuses and so I suggested that they be properly ventilated. The operation was performed a few months ago. Since then there has been an enlargement of the fields. In other words, the nasal symptoms in this case were practically negative. Only a careful eye examination could give a clue.

In certain cases, symptoms, both subjective and objective, do occur in the nose which make one feel that there is no doubt that a lesion of the optic nerve is caused by the nasal affection. The first of these symptoms is a feeling of pressure high in the nose, behind the nasal bones. The patient may refer such pain to the eyes. A second symptom is a pain in the back of the neck, indicating some trouble with the sphenoid cavities. Often patients having such symptoms will

complain of a dripping of mucus or mucopus into the nasopharynx. Yet none of these symptoms is ever very definite.

I have in mind one such case in which, to me, the correlation of symptoms was very definite and yet this patient had her frontal lobes explored with negative results before she had finished her rounds of medical men.

She was referred to me by a very competent eye specialist with a diagnosis of optic neuritis on the left side. Her visual field was markedly contracted. An involvement of the right nerve soon took place. An examination of her nose and sinuses, corroborated by the *x*-ray picture, indicated enough involvement of her ethmoid cells and sphenoid sinuses to warrant an immediate operation. The condition did not clear up as rapidly as the family expected after operation and, so, on the advice of others, she went to a neighboring city to consult a brain specialist. I insisted that she see a certain rhinologist there, who had had a great deal of experience in such cases with the idea that he could refer her to the brain specialist if he thought it wise to do so. A decision was finally made to explore the brain. At operation, the dura was found so adherent to the frontal lobes, that it was deemed advisable not to proceed further with the operation and so the wound was closed and healed by primary intention. Four years have passed since I opened up the sinuses. As far as I know, the patient's eye-sight has considerably improved.

Even when symptoms seem definite, both in the eye and in the sinuses, there are certain cases in which, unfortunately, no improvement results although the sinuses have been well opened. Such cases are most puzzling and most discouraging. Naturally, all other conditions have been eliminated—such as lesions confined to the eye itself, brain conditions and syphilis or other systemic disease. This is evidenced in the following case:

Mr. E. was referred to me about six weeks ago. The ophthalmologist had discovered a marked diminution in vision in the left eye, contraction of the visual fields and retrobulbar neuritis. Because the condition was progressing rapidly, it was decided that the sinuses should be attacked at once. The operation was performed without any mishap. Within a few days after operation, evidence of trouble with the other eye became manifest. Every examination—the blood, spinal fluid, brain, etc.,—was negative. The patient continued to get steadily worse until, today, he has complete amblyopia. If the cause of the trouble is not discovered within a short time, he will become permanently blind.

TREATMENT

In all these cases, the question arises as to the type of operation that should be performed. Should one be content to remove a small portion of tissue only or should he perform a radical operation? Many rhinologists believe that an aeration of these parts is sufficient—that is, that only enough of an operation should be performed to allow of freer circulation. My feeling is that the middle turbinate bone and the posterior ethmoid cells should be removed as thoroughly as possible; that a sufficiently large opening should be made into the sphenoid sinus to allow of free exploration and drainage; that enough of the anterior ethmoid cells should be removed to allow of drainage from the frontal sinus and that both antral cavities should have a large enough opening made into them to allow of subsequent washing. No matter whether the eye symptoms occur on one side only, I firmly believe that all the sinuses on both sides of the head should be explored; for one can never tell exactly which sinus is at fault or whether all the sinuses have something to do with the symptoms.

It is not within the province of this paper to dwell on operative procedures. But one or two important points in technic are worthy of consideration. All such operations should be performed under local anesthesia. The block method of anesthesia is best because it assures an almost bloodless field. The patient should be operated upon in the recumbent position. One should use care in curetting the upper ethmoid cells. It is not necessary to probe into the frontal sinus. One is assured of free drainage of the frontal sinus if he properly removes the anterior ethmoid cells. Lastly, the opening into the antra should be made large enough to allow one to wash them out when the patient returns to the office for treatment.

22 WEST 74TH STREET.

UNUNITED FRACTURES.

It is primarily of the utmost importance in considering the treatment of ununited fractures to bear in mind that not infrequently union may be delayed for various reasons for a short, or even for a relatively long time without any apparent cause, and that in most cases of the kind satisfactory and firm union of the fragments may occur if they be maintained in apposition and correct alignment till this can take place. It is, therefore, important to impress this fact upon the patient, and to resist the impulse, too often yielded to in the last ten years, to resort to some form of open operation. Plates, nails, wires, clamps and bone grafts have too frequently been employed when better and quicker results could have been procured with the aid of such local and constitutional treatment as should be familiar to us all. Even when open operation is necessary for the satisfactory reduction of refractory fragments, the removal of foreign bodies or the replacement of intervening structures, it is often better to use no wires, screws, nails, plates, or clamps to hold the fragments together, for they are frequently quite unnecessary. When placed in exact apposition the ends of the bones will usually stay in place, and can be held with ordinary splints, and will unite more readily and soundly without the foreign body than with it.—HORACE G. WETHERILL and CUTHBERT POWELL in *Colorado Medicine*.

REMARKS ON CANCER OF THE RECTUM

JEROME M. LYNCH, M.D., F.A.C.S.
NEW YORK CITY

Whether cancer is, or is not, on the increase is debatable. Statistics can be arranged to favor either side. The fact remains, however, that 100,000 people in this country are sufferers from this malady, and the problem with which we are confronted is how best we can afford them relief.

The perennial growth of so-called cures, I attribute to the ignorance of the public and therefore the neglect of early diagnosis. Newspapers, in search of hectic headlines, distort the facts of the possible progress of scientists, progress as yet in the incubator stage. As a result, false hopes are raised and lives are sacrificed. It is therefore our duty to educate the public in the knowledge that only tried and proved procedures are to be considered. Trying this and that advertised cure too often delays relief, while the disease has so spread that no help can be given.

Early diagnosis will become a fact only when the public realizes the importance of periodic examinations.

With a thousand cases of cancer of the rectum coming under one's care during an experience of twenty-five years, one must arrive at certain conclusions in regard to cure, and the first of these is that surgery offers the best chance of relief in this most terrifying and insidious malady.

If one were blessed with a microscope eye, he would have no difficulty in reaching a certainty whether all cancer cells had been eliminated at operation. Having no such miraculous organ, however, he can only depend upon his judgment and past experience, and hope by a so-called radical procedure to restore the patient to health and comfort.

I am convinced that whatever the original stimulus to cell growth may be, there is unquestionably a family predisposition to tumor formation, and this undoubtedly accounts for recurrence after prolonged periods of quiescence. More than one of my patients have returned with a recurrence after some ten years of freedom from the disease. Woolsey tells me he saw a patient with recurrence twenty-three years after the first operation. Stockard holds that a poor growth balance is the underlying cause in tumor formation.

However, since we have no definite basis of fact as yet, we are handicapped in our dealing with cancer; we can only rely on what experience may have taught us, and I believe excision to be our only satisfactory course.

But the surgical treatment of cancer cannot be standardized. Each case is individual and presents its own problem; and the man who has had the most extensive experience with cancer problems, is commonly the most capable of solving them intelligently. The man who only infrequently meets these cases has less opportunity of acquiring the needed technique, with consequent poor result.

It is my routine to have all available facts that it is possible to deduce from study of the blood chemistry, kidney function, and a thorough physical examination before operation. Also routine is blood transfusion, half an hour before the patient is brought to the table, and a donor is held ready in case a second transfusion is thought desirable after operation. One of my patients had to be transfused no less than six times before he left the hospital; but he now reports that he has gained twenty pounds, and is apparently in excellent condition. Blood transfusion seems to me to be our greatest aid in tiding the patient through this exhausting operation.

I have always been opposed to a two-stage operation, and while I have tried this method on various occasions, it has confirmed my original belief that the operation in one stage should be that of choice. I have never found it easy to perform a second operation, ten days or two weeks after the original one; whenever attempted I found the original tumor had progressed so rapidly that a second operation was in many instances impossible because of the involvement of the liver or adjacent organs.

The procedure I have found most satisfactory is as follows:—An incision is made from the back of the anus to the sacro-coccygeal joint. The coccyx is removed and the bowel is separated from the sacrum as high as the promontory. The patient is then changed to the recumbent position; the abdomen opened; both leaves of the mesentery are cut; the superior hemorrhoidal is tied, and the tumor, with the glands and fat, is separated by dissection; the anterior rectal wall is separated; the lateral ligaments are clamped and tied. At this stage one of two procedures can be chosen: (1) The bowel is divided and the patient left with an artificial anus; the caudal end is packed down in the pelvis; the peritoneal floor is repaired and the abdomen is closed. (2) The bowel is pulled through the posterior opening; the abdominal wound is closed; the tumor is removed from below; the sigmoid is implanted in the anal canal. On three occasions I have removed the bowel from the brim of the pelvis to the anus and six months later implanted the sigmoid at the anal opening.

CARCINOMA OF THE TESTICLE

It would seem probable that in an epithelial organ, such as the testicle, the most frequent type of neoplasm should be epithelial in nature, and as the only truly epithelial elements of the testicle are the seminiferous and straight tubules these tumors would logically be expected to arise from these structures. —S. GEIST *and* W. THALHIMER in *Annals of Surgery*.

COMPRESSION PARALYSIS OF THE LONG THORACIC NERVE FOLLOWING AN ABDOMINAL OPERATION.
WITH REPORT OF A CASE

MAX THOREK, M.D.,
Surgeon-in-Chief, The American Hospital,
CHICAGO

Peripheral paralyses following surgical operations probably occur more frequently than reported. The American literature on the subject appears to be rather scant. Brickner[1] in 1901 discussed the subject thoroughly in reporting a personal case, and stated that a careful search of the literature revealed only twenty-five reported cases, the great majority of which were foreign. Cotton and Allen[2], a few years later, reported four personal cases and found thirty more in the general literature. The scantiness of reports on this subject, however, should not be regarded as a criterion of its frequency; and general surgeons should be warned against the possibility of such a mishap and take steps to avoid it. I recently saw a case of this kind which was evidently the result of an abdominal operation under general narcosis.

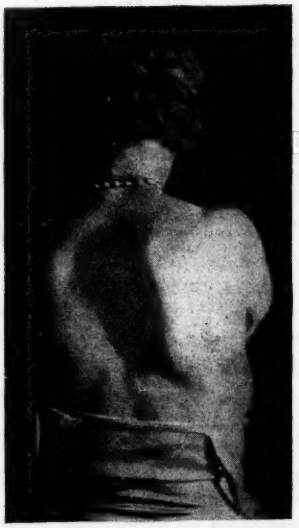
A young married woman came to my office complaining that she could not raise her right arm as she had been in the habit of doing; and also that she noticed a protrusion of the right shoulder blade. She gave a history of an abdominal operation, performed under ether, two months previously. She had not noticed any deformity or lack of motion immediately following the operation, probably because she paid more attention to the abdominal condition, but she had sharp pains along the distribution of the long thoracic nerve. She later noted the above mentioned symptoms and shortly afterward, she complained of slight pain and some disturbance of sensation in the right arm.

I found that, with the right arm hanging loosely from the body, there was considerable elevation of the shoulder blade and an extension outward from the body. The inferior or lower angle slightly approached the spinal column and the medial margin was in an oblique line from below upwards and outwards. The patient was able to elevate the arm only to the horizontal position. With the arm in this position, there was marked winging of the scapula, and it was almost vertical to the chest wall (figure 1). On taking the scapula between the fingers and thumb, I could reach the whole internal surface with the fingers. In this position, no contraction of the lateral parts of the serratus magnus muscle was evident. This contraction is usually present when the arm is elevated to the horizontal position. On passive movements forward with the scapula between the fingers the action of the serratus muscles could be replaced, and while doing this for the patient, she was able to raise her arm above the horizontal line. I found no disturbance of sensation in the extremity.

The case was diagnosed as a paralysis of the long thoracic nerve, with scondary paralysis of the serratus magnus. This complication was probably produced by the position of the patient on the operating table, for she stated that she complained of pain immediately after regaining consciousness following the operation, and that she had no inconvenience of the sort prior thereto.

Pershing[3], in 1897, reported several cases which he termed pressure neuritis. One was that of a man operated on for varicocele. After the operation his left arm was numb, heavy and weak. All the joints could be moved, but only feebly and with difficulty. There was inability to raise the arm (paralysis of deltoid) or to place it behind the trunk (paralysis of latissimus dorsi). Apparently, the entire brachial plexus was damaged at the time of operation. The author describes the condition to the arm having hung over the operating table so that the nerve trunks were subjected to pressure for some time.

In another case, a young woman, after a comparatively trifling operation, suffered in much the same way, but had severe pain, glossy edema and some loss of faradic irritability of one arm. She did not recover full use of it for several months.



Photograph showing the winging of the scapula.

In the third case the paralysis was in the lower limb. The external popliteal nerve undoubtedly had been pressed against the fibula while the patient was on the operating table. The anterior tibial and peroneal groups of muscles wasted, lost faradic irritability and gave the reaction of degeneration to the electric current. The patient did not recover for several months.

In still another case pressure of Clover's crutch caused neuritis of the external popliteal for a few weeks.

As already stated, Brickner in 1901 collected 25 cases of post-anesthesia peripheral paralysis. He reported a personal case of bilateral brachial plexus paralysis occurring during narcosis for an appendectomy. Only 4 other cases of bilateral brachial paralysis occurring during narcosis, could be found in the literature.

In the report of Cotton and Allen, 1903, they cited four cases of post-anesthesia brachial plexus paraly-

sis in their own practice and thirty other cases from the literature. They exclude paralyses evidently due to direct pressure of the body on the arm in lateral postures, or from pressure on the edge of an operating table on the musculospiral nerve, from pressure of leg holders on the peroneal nerves, or from tourniquet pressure. They ascribe the paralysis solely to the fact that the patient is anesthetized with the arms abducted or drawn up over the head, and say that the brachial plexus parlysis never occurs if the arms are flexed on the breast.

In regard to this view, however, Brickner had previously expressed the opinion that, since some cases had been reported in which the arms were lying alongside the body during the operation, the safest rule to follow is to avoid allowing either arm to remain for more than a few minutes in any one position, however innocent that position may appear to be.

But paralysis other than of the brachial plexus also occurs. Klempner[4], in the case of an abdominal operation in which the patient was under narcosis for three and a half hours with the legs held up, found an associated paralysis of the crural and obturator nerves. There were three cases in the literature of crural nerve paralysis following abdominal operations, but no other case is similar to Klempner's own. Some of Pershing's cases, already alluded to, were also in the lower limb.

Any sudden strong compression of a nerve trunk in the conscious subject at once calls forth a reaction of defense. A radialis compression paralysis, which is the commonest type, is often produced during sleep by compression of the arms folded under the head. In the same way compression of a nerve trunk, either from continued pressure of the operating table, or from an abnormal, constrained position of a limb or of the trunk, may result in a paralysis. In the case of the arm there is also Buedinger's[5] theory of compression of the brachial plexus between the clavicle and the first rib.

These paralyses cause a good deal of pain and disability and it may be many months before they are completely restored. The fact that they may occur, and that, to a great extent, they can be obviated, should be borne in mind by all surgeons. The weight of the body should be distributed as evenly as possible over the operating table, and every effort should be made to avoid keeping the patient's body in any constrained position longer than is absolutely necessary.

Brickner thinks that the care of the arms is as important a part of the anesthetist's duty as is the administration of the narcotic. The arms should never be allowed to hang over the edge of the table, as this position threatens the musculospiral nerve by pressure and the entire brachial plexus by stretching. Rotation and superextension of the head should be avoided, unless necessary, as well as prolonged pressure or compression of any kind in any part of the body. The unconscious patient cannot react. Brickner says that the practice of drawing the arms alongside the head is a bad one and should not be tolerated.

In the personal case which I report, the paralysis was rather unusual as it involved the long thoracic nerve. I regret that I have been unable to learn in what position the patient was placed during her abdominal operation, or what was the disposition of her arms. Brickner cites Sehrwald[6] as stating that paralysis of the long thoracic nerve occurs by bruising of the brachial plexus between the clavicle and the scalenus medius in those cases in which the arm is superabducted.

REFERENCES

1. Brickner: Peripheral "Anesthesia Paralysis"—Report of an Unusual Case of Bilateral Brachial Paralysis occurring during Narcosis (for Appendicitis). *New York Med. Jour.*, 1901: **73**: 722.
2. Cotton & Allen: Brachial Paralysis, Post-narcotic. *Boston Med. & Surg. Jour.*, 1903: **148**: 499.
3. Pershing: Pressure Neutritis caused during Surgical Operations. *Med. News, N. Y.*, 1897: **71**: 328.
4. Klempner: *Neurolog. Centralbl.*, 1906: **25**: 107.
5. Buedinger: *Arch. f. Klin. Chir.*, (With biblography), 1894: **47**: 121.
6. Sehrwald: *Deutsch. Med. Woch.*, 1898: **24**: 472.

Acute Appendicitis.

The differential diagnosis of appendicitis must take in the acute lesions of practically all the abdominal organs. It can be made only in atypical cases by elimination and often requires an exploratory operation to verify the diagnosis. Acute enteritis, ulcer—gastric or duodenal, ruptured viscera or gallbladder, nephrolethiasis, pyelitis, cystitis, urethritis, salpingitis, tubo-ovarian diseases, pregnancy and neuroses,—all enter the field of differential diagnosis at one time or another.—Robert John Groom and Walter Wilson Reed in *Colorado Medicine*.

Pneumococcus Peritonitis

From our study of this condition we believe the best treatment is to give an abundance of fluid by hypodermoclysis and proctoclysis and to keep the patient under the influence of opium during the acute onset of the diffuse process. If the toxemia as manifested in the temperature, pulse, and appearance tends to lessen, it is advisable to wait for abscess formation before opening the abdomen. If, however, under supportive treatment, no signs of improvement appear, it is best to resort to surgery.—Henry Heiman in *Archives of Pediatrics*.

SUBLUXATION OF THE SHOULDER. CHRONIC SUBLUXATION OF THE MEDIO-TARSAL JOINT. OSTEO-CHONDROMATOSIS OF THE ELBOW.

A REPORT OF CASES*

SAMUEL KLEINBERG, M.D., F.A.C.S.,
NEW YORK

Subluxation of the Shoulder

A. S., a very stout man, 49 years old, was referred to me for weakness of the left arm. On September 30, 1924, he slipped while walking down a ladder and grabbed a rung of the ladder with his left hand as he fell. He hung thus suspended by his left hand for several moments and then jumped the rest of the distance, some three or four feet. He had immediate pain in his left shoulder and he could not raise his left arm. Feeling that his shoulder was "out of place" he lifted his left hand to a rung of the ladder with the aid of his right hand and forcibly pulled his body away. There

Subluxation of the shoulder. Note the upward displacement of the head of the humerus which is contact with only the upper half of the glenoid.

was a snap or "crack" in the shoulder joint and thereafter he felt somewhat better. Since that date his pain and disability have continued, though he has greatly improved. During the past nine months, however, there has been no improvement and no reduction of the disability. His left arm is weak so that he cannot raise it forcibly, nor can he hold heavy objects with his left hand, particularly at a level above his shoulder.

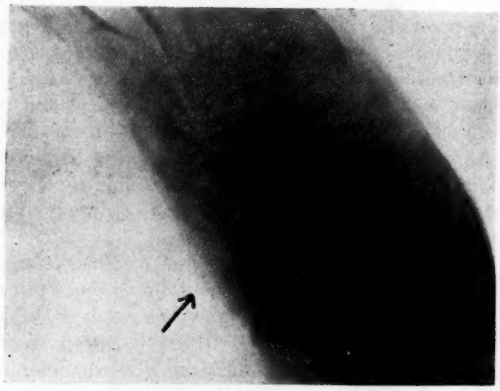
There is slight atrophy of the shoulder, particularly over the external and posterior aspects. There is prominence of the shoulder anteriorly. The man can abduct his left arm to a right angle, but cannot do so when a moderate resisting force is applied. He can flex his arm to a right angle and lift it to a vertical position in the sagittal plane, but not against resistance. Attempts to move his shoulder against resistance are very painful. Passive motion in the shoulder is free, but there is marked crepitus on motion in all directions. There is very definite laxity of the shoulder joint. Roentgenograms taken with the arm at the side and abducted, show a very definite upward subluxation of the head of the left humerus. This is particularly noticeable when the arm is hanging at the side. In this position the head of the humerus is in contact with only the upper half of the glenoid process.

*Presented before the Metropolitan Medical Society, December 22, 1925.

This man evidently has a chronic partial dislocation of the left shoulder. From the history I am inclined to believe that originally there may have been a complete dislocation, subcoracoid or subglenoid, which was reduced by the patient himself through immediate, violent pulling of the arm. There has remained, however, a partial dislocation of the shoulder joint, and probably a chronic synovitis, resulting in a general derangement that is responsible for the persistence of the symptoms.

Chronic Subluxation of the Medio-Tarsal Joint

A. B., a man 36 years old, was referred to me because of pain, stiffness and weakness in the right foot. On March 21, 1925 he fell a distance of about 11 feet and struck his right foot on a cement floor. The foot was forcibly twisted inward and he had immediate pain and disability. The patient noticed soon after his injury that his right foot was turned in. This deformity has persisted. As it was thought that the patient had a fracture, his foot was placed in a plaster of Paris support for several weeks, and subsequently he received physiotherapy.



Subluxation of the medio-tarsal joint. The arrow points to the site of the displacement. Note the wide interval between the astragalus and the navicular.

He walks with a limp on the right side. The right foot is moderately swollen and there is an inversion of the front of the foot, so that he bears most of his weight on the outer border. There is very marked tenderness of the foot and ankle over the external aspect and particularly in the region of the medio-tarsal joint. At the calcaneo-cuboid and over the astragalo-navicular joints the tenderness is especially marked. All of the motions of the ankle are restricted, and forced motion is painful. At the medio-tarsal joint passive motion of any degree is very painful.

A series of roentgenograms shows a definite inward dislocation of the foot at the medio-tarsal joint. The fore-foot, consisting of the navicular and cuboid bones and all of the bones in front of them, has been displaced inward and rotated inward on an anteroposterior axis. The internal extremity of the navicular is displaced inward at least one half inch, and the posterior articular surface of the navicular is in contact with the astragalus only over an area of about one-fifth of its normal articulating surface. There is a wide and evident separation between the head of the astragalus and the navicular. Similarly the cuboid bone is displaced inward so that the area of contact with the corresponding surface of the os calcis is only half of the normal. All of the tarsal bones are markedly rarefied and show the atrophy of disuse. The articular surfaces are hazy and the interarticular spaces are indistinct, indicating the presence of a certain degree of periarthritis and probably fibrous adhesions within the tarsal joints. The trans-

verse area of the tarsal bones is greatly reduced. This is due, I think, to the rotation of the forefoot. In the lateral view there is an overlapping of the adjacent surfaces of the astragalus and navicular, indicating that the two bones have slid past each other.

The condition present in this man's right foot is a chronic subluxation at the medio-tarsal joint. The case is interesting because this result of a trauma is very unusual and because, had the exact diagnosis been made at the time or soon after the injury, there would have been the possibility of reducing the deformity and obtaining a good functioning foot. At this late stage I question very much whether any manipulation, operative or otherwise, will be successful in reducing the dislocation and abolishing the disability.

Osteochondromatosis of the Elbow Joint

M. G., 50 years old, a glazier, sustained an injury of the left elbow in March, 1925. Prior to this time he never had to desist from or do lighter than his ordinary work because of any difficulty with his arms. On March

Osteochondromatosis of the elbow joint. Note the numerous shadows in front and back of the elbow and in joint space.

23, 1925, he and three others were lifting a large section of plate glass. There were two men at each end. The worker helping our patient cut one of his fingers and let go of the glass the weight of which suddenly fell on the patient's hands. He felt a sudden sharp pain on the inner side of his left elbow and had to stop work. At this time he could not move his elbow joint because of pain, but there was no external evidence of injury. About two weeks later there appeared a swelling in the front of the elbow and this has persisted. For ten weeks he was unable to return to his employment. Gradually he improved and at present he is able to do light work, but he still has stiffness and weakness of the left elbow and a swelling on the front of this joint.

There is a marked swelling on the inner side of the left elbow. It is hard, somewhat movable and very tender. It is located in front of the internal condyle of the humerus. The motions of the elbow joint are markedly restricted. Flexion is checked at 80° and extension at 150°. There is crepitus on motion both anteriorly and in the olecranon fossa. Forced motion is painful. There is slight limitation of pronation and supination of the forearm.

Roentgenograms show a marked mottling of the left elbow. This appearance is due to the presence of very many discrete shadows of variable size and shape within the joint area as can be seen in the accompanying picture. The shadows are due to osteochondral masses. These are seen chiefly in front of the lower extremity of the humerus, but many of them are in the olecranon fossa and some about the coronoid process of the ulna. Some of these masses appear no bigger than the head of a pin, while others are at least one quarter of an inch in diameter. There is a large collection of these loose bodies in front of the internal condyle of the humerus causing the swelling noted in the physical examination. The substance of the humerus, radius and ulna is not disturbed. The joint space is hazy, indicating that many of these loose bodies lie between the humerus and ulna.

The other joints of the upper and lower limbs were examined and none of them give any evidence of any pathological change.

This condition is sufficiently uncommon to be of more than passing interest. The special feature, which has concerned me in this case, is the relation between the alleged injury and the very extensive intraarticular lesion of the left elbow. Reference to the literature shows that in at least fifty per cent of the cases of osteochondromatosis, irrespective of the joint involved, there is a distinct history of trauma. It is further noteworthy that the majority of the patients reported are men between the ages of twenty and forty. In my case I am convinced that the injury was the cause or the important contributing factor in the production of the described lesion. This man had worked for the same firm for three years prior to his accident, and had never had any disability referable to the left elbow. The injury resulted in immediate pain and disability, especially limited mobility. The delayed appearance of the swelling is, in my judgment, very significant and is indicative of the causal relation of the injury to the formation of the osteo-cartilaginous bodies. I believe that at the time of the injury many cartilage cells and tabs of synovial tissue were torn loose. These, fed by the synovial fluid, multiplied and formed the nuclei for the numerous masses which through metaplasia became transformed into osteochondral loose bodies. We are dealing here, therefore, with a case of traumatic osteochondromatosis of the left elbow joint.

BONE AND JOINT TUBERCULOSIS.

The process of healing in tuberculous disease, like the onset, is slow and insidious. It requires six to eight months for the smallest bone or bone joint, and four to five years in the large bones or joints, even when uncomplicated. The rule of wearing supporting apparatus from six months to a year after all signs and symptoms have disappeared, is necessary and essential to procure arrest.—CARL C. CHATTERTON in *Minnesota Medicine*.

TRANSACTIONS OF THE SECTION OF SURGERY, NEW YORK ACADEMY OF MEDICINE

MEETING OF MARCH 6, 1925.
THE CHAIRMAN, DR. JOHN J. MOORHEAD, PRESIDING

THE RELATION OF TRAUMA TO MALIGNANT TUMORS

JAMES EWING, M.D.
NEW YORK

Correct conceptions regarding the relation of trauma to malignant tumors are of great importance in the control and prevention of these diseases. Ever since legal liability for the results of trauma has been recognized in civilized communities, this subject has occupied a prominent place in the annals of legal medicine. More recently, since the introduction of workmen's compensation laws, by which the employer may be held liable for every variety of mishap that befalls the employee, the traumatic origin of tumors has taken on increased importance. For industry, and eventually the public, has to bear a heavy burden, partly just, partly fictitious, owing to the great number of awards made on the theory that trauma frequently causes cancer.

Two separate departments in the study of the traumatic relations of cancer may be said to exist. One is represented in the Compensation Courts which, as a rule, and probably with justice, assume that the burden of proof lies with the defendent, who must show that a given tumor could not possibly have resulted from an alleged trauma. If there is a reasonable doubt, an award is generally given. The other, which more nearly interests the physician, is the slow scientific elucidation of the mode of action of trauma in producing cancer, the accurate and critical study of individual cases, in the effort to establish by clinical methods the frequency of traumatic cancer, and the exact conditions under which such a mode of origin may be accepted. At present there is a very wide gap between the two departments, which it is highly desirable to close as soon as possible. The present discussion is offered as a contribution toward that end.

For the present purpose trauma may be defined as a single or repeated mechanical injury resulting in contusion, crushing, or laceration of the tissues. There is, however, another form of trauma, forced upon our attention by industrial conditions, and popular habits, which it is necessary to consider. This is the continued impact of repeated slight blows or mechanical force, which under some conditions appears to have a relation to cancer. This form of trauma may be briefly considered first.

A young plumber who was in the habit of carrying iron pipe on his shoulder tripped and threw off a heavy piece of pipe which slightly injured the shoulder. Two days later a roentgenogram revealed that he was suffering from a well-established osteogenic sarcoma of the head of the humerus. It is obvious that the particular trauma had nothing to do with the sarcoma thus found. Yet it appears far from certain that the long-continued habit of carrying iron pipe on the shoulder did not act as an effective exciting cause of the sarcoma of the humerus. There may well have been some anatomical disorder of the shoulder bones predisposing sarcoma, which would never have expressed itself if there had not been repeated over-exertion, slight strains, and minor traumas of the shoulder.

Another case recently encountered illustrates clearly the principle which is probably involved when minor traumas seem to excite a malignant tumor. A telephone operator who for 15 years wore a rubber receiver over his ear, sustained a minor blow on the ear from the receiver which had caught by the wire and snapped back on the ear. Sometime thereafter a 'blood blister' was observed on the injured ear, and then followed a history of epidermoid cancer, its successful removal by radium, later involvement of cervical nodes, and within a year death from a metastatic melanoma at the base of the brain demonstrated by autopsy. The importance of the single trauma may be doubted. The melanoma could not possibly occur without a congenital nevus in the skin of the ear. The probabilities are that the nevus had been irritated by the constant rubbing of the receiver and after a long time melanoma resulted, possibly aggravated by the trauma described.

I would therefore raise the question how far the habits required in the industries tend to induce malignant tumors in the members and tissues subjected to long-continued strain and mild traumas, and whether breaks in the continuity of these strains or even a change in occupation might not eliminate some of these hazards, if they exist.

Cancer is essentially a disease of habit. The victim of mouth cancer continually irritates the tongue with a sharp tooth and tobacco juice; the patient with esophageal cancer acknowledges that he has for years bolted hot food and used alcohol and tobacco; long-continued local uncleanliness is demonstrated and admitted in the great majority of cancers of mucocutaneous junctions; rectal cancers usually go with a history of chronic constipation; tobacco cancers, betel nut cancers, Kangri oven cancers, are prominent examples of

the results of chronic irritation ingrained in customs and perpetuated by habits.

Do the modern industries introduce a tendency to the formation of any of these cancer-forming habits?

It must be confessed that vicious habits chargeable to the trades are not easily pointed out for the major forms of cancer, as of the stomach, breast, uterus, mouth, rectum. The cancer-producing trades seem to be conspicuous in that they depend on the action of some specific irritant, as in the aniline industry. Yet occasionally one encounters cancers due to some peculiar habit of the individual related to his occupation. I have seen tongue cancer in a carpenter who always held nails in his mouth, and epithelioma of the finger in a seamstress who continually pricked her finger, but these are isolated instances. The bulk of the sweat of industry seem to be transuded without influencing the incidence of the main forms of cancer in the workers.

This conclusion, which seems to be justified by observation, is in some respects surprising. When one considers that thousands of workmen are continually, for hours, days, and years, driving the same bolt, pulling the same lever, breathing the same vapors, tiring the same muscles and special sense organs, it is remarkable that malignant overgrowth of regenerating tissue cells so seldom follows. This fact must mean that work and physical exercise are distinctly protective against cancer. It must also mean that as regards cancer, industrial conditions are favorable, so that Williams is able to point to statistics showing that the working classes are relatively immune to cancer.

However, I do not think one can conclude that many cancers could not be prevented by more thorough inspection and improvement in the habits and working conditions of the laboring classes, by the elimination of obviously hazardous conditions, by the early recognition of precancerous diseases, and by acquainting the workers with the main causes and early signs of cancer in its various forms.

Considering now the question of the single definite trauma, one must inquire what conditions must be supplied to justify the conclusion that the trauma has been the sufficient cause of a malignant tumor.

According to the rulings and statutes of most European countries and the best American practice, the following conditions must be provided before trauma can be accepted as the cause of a tumor:

1. *The authenticity and sufficient severity of the trauma.*

Numerous instances may be cited to show the necessity of insisting that proof that the injury was actually sustained must be provided. A man was seen running out of a saloon followed by an assailant who plunged a long knife into the victim's back, who immediately fell and shortly expired. Such was the testimony of eye-witnesses. Autopsy revealed that the man died of a deep wound of the abdomen delivered from the front. A clerk going down a crowded elevator suffered a scratch from the brim of a straw hat. Some weeks later he developed a tumor of the frontal bone. Autopsy revealed a carcinoma of the prostate and multiple bone metastases, one in the frontal bone. The trauma was utterly inadequate to produce any tumor of bone. Nevertheless he received an award.

It is highly essential to scrutinize most rigidly the evidence, even that of eye-witnesses, or of the patient himself, on which it is claimed that an injury occurred, and I believe such evidence should always require corroboration, verbal, or better, circumstantial.

In medico-legal cases one must even go beyond the fact of the injury and inquire whether the injury was not sustained as the result of disease, not connected with the tumor, and preceding the tumor.

We are all familiar with the cases of fracture of the skull caused by apoplectic attacks leading to a sudden fall. The questions thus established are sometimes very complex. An elderly man tripped over an ordinary doorstep and fell, striking his head. He never fully recovered and in three weeks was found to be suffering from an extensive glioma of the brain which soon caused his death. The total duration was too short to be assigned primarily to the blow on the head. The fall was due to a spontaneous hemorrhage or irregularity in circulation so common in glioma of the brain, and at most the trauma could only have aggravated the symptoms of an old, undiscovered disease.

2. *Previous integrity of the wounded part.*

If this item of evidence were rigidly required most of the alleged traumatic carcinomas and sarcomas would be eliminated. Such evidence is generally difficult to secure, but the lack of it accounts for the wide gap which separates the views of many clinicians regarding the relations of trauma to sarcoma and the scientific proof of such relation. Its absence, among other inaccuracies, permitted Lowenthal to conclude that 44.3% of sarcomas are traumatic, while Kempf by critical analysis reduced the proportion to 2.5%.

Aside from the intentional suppression of the

fact that signs of previous disease existed, it must be recognized that the bodies of most persons are constantly receiving minor blows which pass unnoticed on healthy parts, but whose effects, especially in pain, are intensified in the fragile tissues of a small unnoticed malignant tumor. The unexpected pain and hemorrhage of a trauma is very often the first sign noted of a malignant neoplasm. I have sometimes noted that the presence of an unsuspected or early tumor has interfered with the normal movements of the subject so that falls and blows were sustained which a normal person would have avoided. Some importance therefore, may be attached to the exact conditions under which the fall or blow were received.

A boy of 18 stated that he struck his knee coming down a ladder and that he had done so twice in the previous week. He developed an ossifying osteogenic sarcoma of the tibia, but the roentgenograms taken the day after the last blow revealed a well established tumor, and pulmonary metastases. The surgical attendants vigorously maintained that the tumor was the result of the injury, because it was so small and the boy had been able to work.

Cases of supposed traumatic carcinoma of the breast not infrequently appear. In a recent case the employer was held liable because his son had accidentally struck the cook on the breast a few days before a tumor was discovered. The subject was a woman of 50 years, both of whose breasts showed an advanced grade of chronic cystic mastitis. It is difficult to conceive how a slight blow on a normal breast can act as a sufficient exciting cause of mammary cancer, and I do not believe that it does so.

In another case a young surgeon described the condition of the breast in a woman, 31 years of age, mentioning diffuse induration, redness of skin about the nipple and extending up to the shoulder, and local pain. The case ran the typical course of acute inflammatory carcinoma in a young woman, terminating fatally in eight months total duration, five months after radical amputation. Shortly before her death a claim for compensation was made on the basis of two injuries to the breast, one from falling down stairs, the other from falling against a stove door. Yet, the description of the breast two days after the first injury was not that of abrasion of the skin, but of acute inflammatory carcinoma which must have existed some weeks before. I know of no case in which the previous integrity of the breast has been proven in supposed traumatic carcinoma of this organ.

There are, however, some rare cases in which comparatively young women, in whose breasts no previous disturbance had been noted, developed carcinoma some weeks or months after receiving a severe blow on the breast. When such an injury is severe enough to cause interstitial hemorrhage, and solution of continuity of mammary ducts, and when the remainder of the breast shows freedom from chronic mastitis and its precancerous changes, and when there is some indication of a continuity of symptoms from the trauma to the appearance of the tumor, then one may be prepared to maintain the probable relation between the two. Under other circumstances it seems to me unjustifiable to claim any such relation. The breast frequently receives severe blows without any subsequent development of cancer. The most common progressive lesion resulting therefrom is the fat necrosis described by Lee and Adair, which may closely resemble cancer even under the microscope; but in a considerable series of such cases which I and other pathologists have examined, cancer has never been associated. A careful and critical microscopic examination of the cancer supposed to have followed trauma should be required in every case, before it may be accepted.

3. *The identity of the injured area with that giving origin to the tumor.*

A blow in one part of the body cannot be assigned as a cause of a tumor arising in another part. The exact location of the trauma must be determined, as well as its capacity to injure the tissue giving origin to the tumor.

A war veteran applied for sick benefits because of a carcinoma of the testis which he alleged was the result of a kick from a mule, and this story survived through several histories taken by Government officers. On careful examination it was proven that the kick was delivered on the buttock and not on the scrotum.

It is not always possible to determine whether the injury could affect the tissues giving origin to the tumor. An elevator man received a blow from an iron pipe, in the region of the navel, which threw him backward on a stool where he landed on his buttocks. Later he developed a carcinoma of the sigmoid. It may be possible, but it is very difficult to conceive how such impacts could injure a normal sigmoid, but it is easily conceivable that an adherent carcinoma of the sigmoid could be induced to bleed by such impacts delivered in its rather distant neighborhood.

Certain tumors of the lung have been reported as following trauma, but I have been able to find only one satisfactory case in the extensive litera-

ture. This is the case of Lepine (*Lyon Medical*, 1903, **100**, p. 18) who described a squamous cell carcinoma involving the chest wall and the lung tissue at the point of injury and appearing one year after the considerable trauma. When the tumor involves the deep parenchyma only, or when, as is more frequently the case, it arises about the root of the lung, it is impossible to conceive how it can be the result of a blow on the chest, especially when the blow has not been followed by severe symptoms of pulmonary damage.

A neurosarcoma involving the deep sciatic plexus was alleged to have been a result of a blow received on the greater trochanter, but it is clearly impossible to connect this tumor, which is essentially dependent on congenital abnormality of the nerve trunks, with such an injury.

In the brain, the effects of countrecoup may possibly explain the traumatic origin of cerebral angiosarcoma arising on the opposite side.

In 1897 Adler, (*Arch. f. Unfallheilk, 2,* 189) collected 1086 cases of brain tumors, in 8.8% of which there was a rather definite traumatic history. Yet there was no attempt to distinguish between angiosarcoma which might conceivably arise from injured blood vessels, and true glioma for which a traumatic origin is much less acceptable. The low regenerative capacity of glia cells and especially of ganglion cells does not favor the view that malignant tumors of these cells may frequently be ascribed to trauma. I have derived very little satisfactory information from a pursuit of the literature of this subject. On the other hand the neoplastic processes in nerve tissues seem to be notably connected with congenital disturbances in the structure and development of the fetal ectoderm.

4. *The tumor must be of a type that could conceivably result from trauma.*

The structure of the tumor may preclude its being of a traumatic origin. Dermoid cysts, adrenal tumors of the kidney, endothelioma of the dura mater, mixed tumors of the salivary glands, neurosarcoma, branchiogenic tumors of the neck, basal cell carcinomas, and many other tumors are known to arise from congenital disturbances in the structure of organs, and cannot well be assigned to a traumatic origin.

Ribbert once expressed the opinion that quiescent tissue rests could be excited to growth by trauma, but he did not refer to any specific case in which it had actually done so. I have never encountered such a case.

In another group the organ is fully protected from injury, and the tumor is known to result from chronic irritation or long-continued disturbance of structure and function. Here may be mentioned some of the most frequent types of cancer, as gastric, rectal, uterine, pancreatic, and hepatic. Cancer of the root of the lung, bronchi, esophagus, and gallbladder, have a very definite etiology in which trauma does not figure. The circumstances must be extremely unusual to permit one to entertain the idea that any of these common forms of cancer may result from trauma.

5. *There must be a proper time interval between the receipt of the injury and the appearance of the tumor.* This interval varies with each tumor.

Many supposed traumatic tumors fail to meet this requirement. A well advanced sclerosing osteogenic sarcoma requires months for its development and cannot be assigned to a trauma of recent date. The rapidly growing carcinoma of the testis cannot be attributed to a blow on the testis received a year or two before.

In some cases there is a distinct continuity of symptoms, those of the injury merging with those of the tumor. A perfectly healthy and mentally active man received a severe blow on the skull which rendered him unconscious, with symptoms of cerebral concussion from which he never fully recovered. In the course of a few months the symptoms became slowly aggravated and he died shortly thereafter from a vascular sarcoma of the brain arising at the point of the injury.

A previously healthy and muscular adult male struck his knee cap against the iron step of the stairway of an elevated road station. The blow caused hemorrhage, swelling and complete disability, which never subsided. After a slight intermission, the swelling became much worse and incision revealed a very cellular spindle cell periosteal sarcoma, from which the patient died about six months afterwards. This is one of the few cases of osteogenic sarcoma I have seen that was clearly referable to trauma.

Recently a very striking and somewhat similar case came to my notice. A boy of 14 received a blow on the inner side of the femur while playing basketball. There was immediately a slight swelling without contusion which he nursed for two weeks, when his parents called in a doctor. A roentgenogram disclosed a slight lifting of the periosteum and a slight erosion of the cortex of the shaft. One month later, without local changes, a roentgenogram disclosed further raising of the periosteum, and more erosion of the bony shaft, and a diagnosis of osteogenic sarcoma seemed justified. On account of the lack of pain there is still some uncertainty whether this is a subperiosteal hematoma with ostitis or

a true sarcoma. And again it seems not unreasonable to consider whether a sarcoma may not be developing on the basis of such a hematoma. Here is just the territory that remains quite unexplored by the microscope.

There is strong evidence to support the view that the benign medullary giant cell tumors of bone result from hemorrhages in the bone marrow, and that these hemorrhages are preceded by chronic ostitis fibrosa. In these cases a traumatic history is frequently obtained. More frequently the traumatic history is missing. It seems probable that the blood vessels are rendered more fragile by the ostitis fibrosa so that the trauma acts on a tissue predisposed to hemorrhage. Yet the natural history of ostitis fibrosa is complicated by hemorrhages and cysts, especially in those cases where the tumors and cysts are multiple. In a remarkable case recently reported by Loos (*Zeitschr. f. Chirurgie*, 1924, 189, 113) in which nearly every bone in the body was the seat of tumors or cysts, there was no element of trauma.

Very surprising are those very rare cases of epithelioma following single lacerated wounds of lip, tongue, skin and various mucous membranes. Horse bites, bee stings, needle punctures, and a considerable variety of tissue insults have been reported as immediately preceding the outbreak of cancer. The most puzzling feature in all this group of cases is the fact that the mode of action of the trauma must be quite different from that of chronic irritants which usually require years to unfold their effects. Having personally seen very few such cases, I hestitate to refer to them. Every instance of this sort should be submitted to very critical examination before it may be accepted, especially with regard to the previous integrity of the tissue.

As a rule there should be a definite and not too prolonged interval between the trauma and the development of the tumor, during which the regenerative processes excited by the trauma have time to take on a malignant character. The immediate response to trauma is nearly always of normal type.

A young man was received at Bellevue Hospital with a recent fracture of the clavicle and was treated in the usual manner. After two weeks the swelling that appeared at the beginning had steadily increased until it formed a tumor as large as a goose egg. The surgeon took alarm and extirpated the clavicle, fearing sarcoma. The condition proved to be merely an excessive formation of callus about an ununited and imperfectly immobilized fracture.

The ordinary lesions of trauma are completely healed and the area cicatrized within a few months or a year. Beyond this period it is difficult to trace any relation between the trauma and a tumor in the same locality. Three years has sometimes been named as the longest interval which may elapse before a trauma may be set aside as a possible cause of a tumor, but obviously no uniform rule can be stated and each case must be considered by itself. With the passage of time the relation of the trauma becomes less and less satisfactory. Islands of epithelium incarcerated in an extensive scar may conceivably develop carcinoma after a long period. Yet in the vast majority of instances such incarcerated islands of epithelium undergo atrophy. The condition in which isolated groups of epithelial cells are known to develop cancer are found in inflammatory processes, as chronic mastitis or prostatitis, where chemical irritation is the effective factor and the displacement of the epithelium only a predisposing element.

The foregoing review of the data required to establish the traumatic origin of a malignant tumor emphasizes the complexity of the problem. It is obvious that such data are very seldom presented, and many of them are difficult to obtain. Some of them are essentially matters of interpretation rather than of definite determination. Nevertheless, without them one cannot assert that a tumor is of traumatic origin. The traumatic theory runs against too many general objections to permit its uncritical acceptance. The most formidable obstacle is the fact that there is not a single form of supposed traumatic cancer that does not arise frequently in exactly the same form, entirely free from any suspicion of trauma. Loewy, in an observation of 26,389 injured persons, found 37 malignant tumors, attributable to trauma as either a primary or an activating factor. Assuming that all the cases were genuine this degree of frequency of alleged traumatic cancer, 1 to 700 injured persons, is not much greater than the incidence of cancer in uninjured persons. The annual death rate from cancer in some cities runs about one per thousand of the persons living. Moreover the effective exciting factors of most of the common forms of cancer are sufficiently well known to exclude trauma. Hence it is a safe conclusion that trauma very rarely produces cancer de novo. More often it brings to light a previously existing cancer or excites a miniature cancer or possibly a pre-cancerous lesion to more rapid growth.

A further important inquiry relates to the aggravation of a malignant tumor by trauma. Since injury seldom retards growth, the decision al-

ways involves the degree of the aggravation. Here it seems reasonable to demand that the aggravation must cause a definite alteration in the course of the tumor, a change in the local lesion, and a shortening of the duration of the disease.

A young man was found to be suffering from a medullary sarcoma of the humerus of several weeks duration or more, and alleged to have been the result of a blow on the shoulder. A week after the first roentgenogram was made, showing marked absorption of the shaft, a surgeon attempted to reduce a supposed dislocation and fractured the bone, which was immediately followed by rapid swelling, and increased pain, and shortly thereafter death occurred from metastases. This tumor could not have been caused by the blow, but it was definitely aggravated by the fracture. Whether death was hastened by the fracture, is a matter of opinion. Since the first roentgenogram showed that the fracture was imminent, it is very doubtful if the natural course of the disease was materially altered.

A woman with advanced cancer of the breast received a blow over the invaded skin, at which point the tumor soon fungated. Yet the patient lived for 30 months after the first symptom of the tumor, a total duration which renders it unlikely that the blow hastened death. A great number of instances arise in which injury of a tumor seems to accelerate the course of the disease, but the cases in which such a general effect is really observed are comparatively few, and should be rendered conspicuous by some definite alteration of the nature of the lesion or shortening of the natural course of the disease.

Lesser degrees of aggravation of tumors by injury occur under such a great variety of conditions that unless a distinct change in the local lesion and a definite shortening in the course of the malady are demanded, one is forced to the absurd conclusion that every malignant tumor is aggravated by every blow, jolt, or jar that the patient suffers. Very few cases of cancer run their course without some minor traumatism to the tumor. As a rule these minor traumas merely anticipate events that were imminent. A weakened blood vessel is about to break, a hollow organ is about to suffer occlusion, an eroded bone is ready to fracture, metastases are in the forming, and any acceleration of the heart, any unusual exertion, even straining at stool, may precipitate a serious change in the condition of the patient. All such minor traumas, it seems to me, should be regarded as immaterial, since their results are inevitable in the natural course of the disease.

In concluding these remarks on trauma, the hope may be expressed that this subject should receive more scientific study than it has yet had. Industrial organizations might profit by encouraging such study. At present our main notions about the relation of trauma to cancer depend on statistical studies of observers who are often rather uncritical or biased in one direction or another.

The character of the literature on this subject has not greatly improved, since Phelps, in 1910, revealed its chaotic state. (*Annals of Surgery*, 1919, **51**, 609.) Progress might be made in two separate fields. First, carefully prepared reports that can withstand critical examination may be gathered of tumors resulting from trauma. By this means reliable statistics would be furnished, which are now lacking. Second, there should be systematic study of the results of regeneration after trauma of the various organs and tissues. Whether such studies would throw important light on the subject is somewhat doubtful. The two regenerative conditions which structurally most resemble sarcoma are probably the callus of healing fractures, and myositis ossificans, which are almost never followed by sarcoma. Yet, the evidence thus gathered would form a sound basis for the interpretation of the results of injury.

Experimental efforts to produce cancer by various forms of single trauma have been carried out on an elaborate scale by Ribbert, Lubarsch, Lengemann and others. Not a single definite success has followed these efforts. The misplaced cell groups, after a variable period of growth, have always regressed. Ribbert succeeded in producing considerable grades of somewhat atypical overgrowth of duct cells, by ligating the ducts of certain glands, but the overgrowth was not continuous. Isolation of a tissue mass along three sides was sometimes followed by slight atypical overgrowth but no tumors were produced by these methods simulating as far as possible the conditions occurring in mechanical trauma.

Until more scientific study has furnished a definite basis on which opinions and decisions can be based, industry must bear the burden of a great number of illegitimate awards. While these conditions prevail the only solution of the dilemma seems to be the establishment of universal health insurance, by which the State, the industrial corporations, and the workman combine to share the wear and tear of the toil of industry.

Discussion

Dr. Charles E. Farr: Has Dr. Ewing ever seen a case in which a definite malignant tumor followed a single trauma and in which the evidence of cause and effect could be reasonably sustained? In my comparatively small experience with malignant disease I have never seen a case that would stand close scrutiny. In acute osteomyelitis, bone and joint tuberculosis, hernia, etc., the rôle of trauma is

growing smaller as the cases are more carefully investigated. I feel that even Dr. Ewing's low estimate of malignant disease caused by trauma is higher than future investigations may determine. When we consider how universal trauma is and again how common malignant disease is, and that the combination of trauma and malignant disease is quite unusual, it would seem that practically every case could be explained better by coincidence. Is it not the old *post hoc ergo propter hoc?*

DR. W. P. HEALY: It is quite impossible to add anything to this subject which Dr. Ewing has covered so thoroughly and so well. We in the gynecological field constantly have brought forward claims of tumors occurring in the pelvic viscera as a result of trauma which I believe are unfounded and cannot be substantiated.

DR. LEON T. LEWALD: This is a very interesting subject. The roentgenologist sometimes discovers a malignant tumor, first evident at the time an injury has produced a fracture or some similar condition and then the antecedent pathological condition is recognized. Sometimes a more benign condition, such as Paget's disease, has first been discovered through a fracture. I have, however, seen one case in which sarcoma of the femur followed bone plating for fracture. That is the only case in which I was sure a sarcoma absolutely followed the trauma. That case occurred in the City Hospital about ten years ago and I made the *x*-ray examination at the New York University Clinic.

DR. EWING: I am glad Dr. Farr raised the question whether I have ever seen a traumatic malignant tumor. There is no doubt that under some circumstances a single trauma may produce a malignant tumor. I have seen several cases, and believe that there exists a considerable group of traumatic malignant tumors, in which, however, the traumatic origin has not been proven. We do not know how frequent they are. It is sometimes difficult to distinguish between trauma and chronic irritation. At one end you have a single trauma and at the other chronic irritation and in between you have every grade of trauma. When the trauma is frequently repeated we are getting into the field of chronic irritation, and that type of tumor was not discussed at this time.

PRESENTATION OF CASES

LACERATION OF FLEXOR TENDON AND ULNAR NERVE SUTURED WITH SILK—NOT IMMOBILIZED—SIX MONTHS POST-OPERATIVE

DR. WILLIAM CRAWFORD WHITE

M. T., A 20494, The Roosevelt Hospital Service, First Surgical Division. Division of flexor sublimis digitorum to the left ring and little finger. Division of the ulnar artery and nerve. Partial laceration of the muscular belly of the flexor carpi ulnaris.

Immediate operation March 22, 1923. Suture with silk and free motion allowed at once. Later, baking and massage.

May 8, 1923. Fair degree of flexion of the two fingers involved. Extension also limited. Hypothenar atrophy.

February 10, 1925. Complete movement, slight fractional delay in sudden extension of the fourth and fifth fingers.

This is an example of silk suture and immediate active movement.

Discussion

DR. CHARLES E. FARR: I congratulate Dr. White on this splendid result. I would like, however, to ask him to give further details about the silk suture.

DR. FENWICK BEEKMAN: Some years ago I showed a case in which I believed the outcome was very satisfactory, but Dr. White's patient's function of the intrinsic muscles of the hand is better than mine. Those are the ones apt to stay out of commission because the ulnar nerve does not regenerate very well. We used to have the idea of putting these hands in splints for three weeks. This is a very bad practice, for one should start with active instead of passive motion. I do not believe that baking is of any use.

DR. CLAY RAY MURRAY: I think this is a beautiful example of what active motion without baking and massage can do. I have always felt that the use of baking and massage has been used too often as a substitute for, instead of an accessory to, voluntary movement in the so-called after-treatment of traumatic conditions. The term after-treatment should be discarded, and some such term as functional treatment used instead. What we should be aiming at in this treatment is the preservation in so far as possible of functional activity of the whole part during the treatment of the particular structure in the part that has sustained injury. There is nothing equal to the active exercise of function for this purpose, as is obvious. Often baking and massage are relied on, during the treatment of the actual trauma, to take care of the functional preservation of the part as a whole, when voluntary active function within pain limits is perfectly possible. We are then faced with the necessity for real after-treatment to restore function lost through inefficiency of our efforts to preserve function while treatment of the trauma was being carried out.

DR. JOHN C. A. GERSTER: I think it is most important to remember that unless the injured hand is protected the patient is apt to get careless a few days after operation and, by catching the fingers, may inadvertently tear out the sutures. There is no doubt that active mobilization within the limits of pain is most essential. Well-trained physiotherapists get marvellous results. Very few results, however, are as good as these shown by Dr. White.

DR. JOHN A. MCCREERY: I was glad to hear Dr. Gerster say what he did about physiotherapy because I disagree with Dr. Beekman and Dr. Murray. The results are good in this case and it is of interest that the man did not start active motions until a week after operation. I do not believe that active motion can be started much before that time.

DR. GERSTER: I should like to add that I had a case referred to me which had been treated with baking and massage twice a week for seven months and the patient had a hand that no amount of baking and massage could have benefited. He had noticed the record of the temperature of the baking machine and that it never rose above 130°. I asked one or two men who make a specialty of that treatment what the proper procedure was and they said the routine treatment was between 400° and 450° of dry heat prolonged for half an hour. We cannot judge whether baking and massage have produced results unless we know the treatment was administered competently.

DR. EDWIN G. RAMSDELL: It would be of interest to know what after-treatment this patient had. I understand that the patient was lost sight of two days after the nerve and tendons were sutured until two or three months later.

DR. FENWICK BEEKMAN: I believe that active motion is more important than passive motion because in active motion the patient uses the tendons in the direction of the muscles to the part, whereas in passive motion the movement is from the end of the limb towards the muscle. In addition to this the patient is exercising his muscles and not overdoing it, while in passive movements the motion can be easily overdone. I agree with Dr. McCreery that active motion should not be started for six or seven days, but we should then encourage real active motion and get the individual to use his fingers to the limit. To tell them to use them is not enough; they will not use them without encouragement. As far as baking and massage are concerned, the idea is to keep up the tone of the muscles and active motion is the best for this. Baking will increase tone only by improving the circulation, but what is wanted is to prevent the formation of adhesions between the tendon and the sheath. Normal motion is the thing that will best do this.

DR. WHITE: In answer to Dr. Farr, the point I was trying to bring out was that I used simple silk sutures instead of catgut. Chromicized catgut cannot be used in these fine tendon sutures and silk is too strong. It has the fault of being a foreign body, but this man was fortunate

enough to get healing by first intention. I think silk is to be preferred and the patient should be encouraged to use the hand as soon as he will do so. In answer to Dr. Ramsdell, I would say that he was lost sight of in two days after the operation on March 22 and seen again on May 28th and was then sent to the dispensary to have baking and massage. At that time I made a note that there was atrophy. He says there has been slow but steady progress since the operation.

ANTERIOR DISLOCATION OF THE LEFT HIP WITH TRANSVERSE FRACTURE OF THE MIDDLE THIRD OF THE LEFT FEMUR

DR. WILLIAM CRAWFORD WHITE

William B., age 49, stonesetter, Lincoln Hospital, No. 58017. Admitted November 29, 1922. Within a few hours there was a closed reduction of the anterior dislocation of the left hip, with the application of tongs for the fracture, under gas and ether. In flexion of the thigh and with pressure on the upper portion of the femur, from before backwards, the dislocation was reduced. Tongs were applied to the femur just at the flare out of the condyles, and the extremity then put in suspension with 25 pounds traction on the tongs. On December 6th this was reduced to 15 pounds. December 31 (32 days of traction) tongs removed. Ten pounds through adhesive skin traction then applied. On the 57th day traction and suspension stopped. Measurements showed one-half inch shortening. Seventy-second day, allowed up in chair. On the ninety-fourth day he was discharged from the hospital. January 29, 1924, fourteen months after the accident, he had one-half inch shortening with equal measurement of the thighs and legs and flexes the leg actively and passively 90°, the other leg 135°. Hard callus may be felt. He was awarded 45% loss in the compensation commission.

He tells me that he was bending over with his legs somewhat apart when a very heavy stone tumbled and hit him in the left hip, from the side and the rear.

Stimson (Fractures and Dislocations, 8th Edition, 1917) discusses the subject. He mentions Hamilton, who collected four cases, and Allis, who collected three. Kammerer in the *N. Y. Medical Journal*, February 16, 1889, reported a suprapubic dislocation with fracture between the upper and the middle thirds of the femur in which reduction was not made and he collected twelve other cases of fracture of the shaft with various dislocations.

Stimson says that possibly reduction might be effected in dorsal cases by using the weight of the limb to make traction in the prone position. In other forms traction with pressure on the head should be tried. This failing, McBurney's hook should certainly be tried.

(*No discussion*).

COMPOUND FRACTURE OF THE ANKLE

DR. CLAY RAY MURRAY

Male, aged 42, admitted to the Lincoln Hospital, February 7, 1925, had been found lying on the street, alcoholic, with no history as to the mechanism of his injury. The lower end of the right tibia was protruding from a wound about 3 inches long on the inner and anterior aspect of the ankle. Two inches of tibia were exposed. He was taken to the operating room, where a débridement was done, and the condition found to be a fracture of the internal malleolus, a complete and wide separation of the inferior tibio-fibular joint, a fracture of the fibula about 2 inches above the lower tip, and a complete posterior and outward dislocation of the foot with the attached portion of the fibula. The protruding portion of the tibia was thoroughly cleaned, and as the compounding had apparently occurred from within, was then replaced, and the dislocation and fractures were reduced. The wound was left open and the parts immobilized in moulded plaster splints. No infection developed. Five days after operation the patient got out of bed, refusing even crutches, and has been walking on the splints ever since. The roentgenogram shows excellent position, and the patient walks without any appreciable limp. He is still in the splints. I offer the case for comment.

In my opinion, the end-result will not be nearly as good as seems to be the case at present. There is marked circulatory interference which will be of long duration, if not permanent, and which can be affected only little by baking, massage, etc. In lower extremity fractures much of the disability is due to the swelling of the part when the patient is on his feet for any length of time, even though the *x*-ray appearance and the movements of the part are excellent. The condition of the circulation in the part is of prime importance in future function, is often neglected, and will in this case, I am sure, be a cause of some disability in the future.

(*No discussion*).

SPONTANEOUS SLOUGHING OF GALLBLADDER AFTER CHOLECYSTOSTOMY

DR. CLAY RAY MURRAY

Female negress, age 38, admitted to Lincoln Hospital, February 12, 1925, with a history of two days cramp-like pain in the epigastrium, with radiation to the right lower quadrant. Had vomited six times. No chills, no feeling of fever. The temperature was 100°, pulse 90; the abdomen showed general right-side rigidity, most marked at and just below the level of the umbilicus, with rebound tenderness. There was a sense of mass at the level of the maximum tenderness. Blood count showed 14,000 white cells with 80% of polymorphonuclear cells. The diagnosis lay between acute cholecystitis and acute appendicitis. Through a medium high right rectus incision the abdomen was found to contain some slightly turbid free fluid. The appendix was normal. The gallbladder extended below the umbilicus, was tense, gangrenous in spots, about 8 inches long, and lay at the cystic duct behind a liver so contracted and atrophic that the liver edge was about two inches above the costal margin. Under the circumstances removal of the organ in an acutely ill patient was out of the question, and a cholecystostomy with tube drainage was done. The wound showed a severe infection, despite primary drainage, of the type characterized by death of tissue and slough rather than suppuration. On the 15th day a slough came from the wound, and was about to be discarded when comment was made as to the large size of this slough coming from the upper angle so close to the rib margin. Looked at more carefully, it proved to be the whole gallbladder with all coats from the fundus with the opening for the tube to and including part of the cystic duct. With the passing of this slough the biliary discharge ceased in a few days, and the wound is now clearing up. The specimen of gallbladder is presented herewith.

(*No discussion*).

AN ELECTRIC CABLE-DRIVEN BONE INSTRUMENT

Demonstrated by

DR. JOHN J. MOORHEAD

This cable-driven electric bone saw is operated from a ⅛ H. P. motor which can be used on the direct or alternating current. The tool holder is shaped like a telephone receiver, weighs about four pounds and is nickel brass; but all the wearing parts are of Monel metal and in general the entire construction is like that used in automobiles.

The flexible five-foot shaft attaching the tool holder to the motor is the same as the shafting used on automobile speedometers and dental engines.

The main idea was to make the whole apparatus sterilizable, flexible, portable and fool-proof. Emphasis was laid on the fact that there was no possibility of short circuiting and another feature was that the single or double saws could be so used as to make unnecessary the use of a right-angled attachment.

The apparatus is much cheaper than any other on the market and has been perfected by electrical engineers.

[The apparatus was described and illustrated in the *Journal of the A. M. A.*]

MEETING OF APRIL 3, 1925

THE CHAIRMAN, DR. JOHN J. MOORHEAD, PRESIDING

PRESENTATION OF CASES

CHOLECYSTECTOMY AND APPENDECTOMY; PULMONARY EMBOLI.

DR. LOUIS CARP

An American housewife of 43, with an irrelevant past history gave a typical history of gallstones over a period of 10 years. Recently the attacks of pain have been so severe that she requested operation. Her physical examination was negative except for general abdominal tenderness, especially underneath the right costal margin, where there was also rigidity. No masses could be felt. Urine negative. She was operated on September 11, 1924, at the Polyclinic Hospital through an upper right rectus-splitting incision. The gallbladder was found slightly enlarged, thickened, and full of stones. The appendix was slightly injected and not adherent. The other viscera were negative. The gallbladder was stripped from its bed and the cystic duct tied off with plain catgut. The appendix was removed, the stump ligated, phenolized and not inverted. The abdominal wall was closed in layers and a cigarette drain was placed down to the stump of the cystic duct and a small packing against the liver bed.

The day after operation, her pain had disappeared and she was so comfortable that she was on a back-rest reading a newspaper. She continued perfectly well until the morning of the 6th day, when at 7.30 she complained of a cramp-like pain in the left leg. As this did not disappear, her nurse undertook to massage it about three quarters of an hour later. The patient promptly had a general convulsion and became cyanotic and pulseless. This lasted several minutes, after which she regained consciousness and was apparently well. Five minutes later she had a similar attack and the nurse called me with the information that the patient was dying. On arriving at the hospital 20 minutes later, the patient was in shock position; the nurse was giving her oxygen; she had already received all kinds of stimulation and the resident surgeon was at the bedside. The patient was very cyanotic; her breathing was shallow and jerky and from 8 to 10 per minute. She was unconscious, her pupils were widely dilated, she had a froth at the mouth and an involuntary bowel movement. A diagnosis of pulmonary embolism was made. Oxygen was pushed and intensive digitalization with hypodermatic injections of digitan was begun. In about three quarters of an hour the pulse became perceptible and the patient began to improve. The respirations were more regular and her color a little better. In about one hour and a half she was semi-conscious and in three hours fully conscious, well aware that there was something radically wrong. Inasmuch as she had no pain, morphine was not given, for fear of paralyzing the respiratory center. The gravity of the condition had already been explained to the family. She became quite restless and morphine administration was begun, and digitalization and oxygen administration were continued. In the next four days she was between life and death and her condition especially became worse whenever she became distended. This, however, was controlled with carefully given colon irrigations. Her excellent nursing had a lot to do with tiding her over. Exactly one week after her first embolus she got a sudden attack of severe sharp pain in the right chest; she became very cyanotic, and her respirations went up to 40. Her pulse, however, stayed of good quality and about 100. Her lungs, then examined for the first time, showed consolidation over both lower lobes posteriorly. The patient began to improve from now on. Twenty-two days postoperative she developed a right femoral phlebitis. This was treated by rest, elevation, and application of an ice-bag. Twenty-seven days postoperative she was sent home in an ambulance. Her lung signs gradually cleared up, and her phlebitis disappeared in about two months. Now about seven months after operation she is perfectly well.

Conclusions: This case is presented, first, as a patient recovered, who was as close to death as one can imagine from pulmonary embolism; second, because of the possible causal relation of the massage of her left leg to her first pulmonary embolus; and third, because, despite the fact that her pain was in the calf of her left leg, she subsequently developed a right femoral phlebitis.

Discussion

DR. SEWARD ERDMAN: The matter of pulmonary embolism is something every surgeon encounters, much to his regret. Richardson said that embolism was one complication of operation that could not be prevented. The figures show that, first, pelvic operations and, second, those on the gallbladder are the ones that are most apt to be followed by thrombosis of a vein and embolism. I am interested in this case because in the last year in one case in which a large embolus lodged in the pulmonary artery we expected to see the patient die immediately. He became better in twenty minutes and lived four hours. He complained of numbness in both legs and could not move them. At autopsy it was shown why he lived four hours. The foramen ovale was patent and this allowed a maintenance of the circulation for some time. The numbness of the legs was due to a paradoxical embolus at the bifurcation of the abdominal aorta, which embolus had apparently come through the patent foramen ovale. Very recently I heard of another fatal case in which the patient lived four days in a desperate state and yet maintained his circulation. At autopsy found that he had an unsealed foramen ovale functioning. It may be that some of the cases that take long to die are those whose lives are prolonged by unclosed foramen ovale which is found in 5% to 10% of all autopsies, the open foramen permitting some blood to pass through.

DR. CARP: I was at a loss to understand why the patient with the pulmonary embolism had the initial convulsive seizure. After what Dr. Erdman said, my first idea of the subject seems correct. She may have a patent foramen ovale allowing brain embolism. I was very much interested in a reprint from Dr. Willy Meyer received a few days ago in which he explains the occurrence of femoral thrombosis from the standpoint of posture. It has been thought for a long time that thrombosis occurs on the left side because of the greater obliquity of the iliac vein on that side, and because it is crossed by the right common iliac artery. In addition, in 31 dissections, there have been found adhesions between the anterior and posterior walls of the left common iliac vein in nine. Perhaps the distended sigmoid plays a rôle. If slowing of the circulation in the extremities is a factor in producing thrombosis, Dr. Meyer tries to avoid this by placing the patient in a slight Trendelenburg posture after operation. Since he has employed this method he has seen very little thrombosis or embolism.

STAPHYLOCOCCUS AUREUS SEPSIS. OSTEOMYELITIS OF FEMUR, RADIUS AND MANDIBLE.

DR. LOUIS CARP

An American schoolgirl of 11, first seen on June 6, 1924, had pain in the region of the right knee and fever which she had for three days. On returning from school three days before, she complained of pain in the region of her right knee, which was made worse by walking. She had some fever and went to bed. She vomited several times and had very little appetite. The family physician thought she had rheumatism and he gave her a cathartic and salicylates. The next day the pain and the fever continued. An ice-bag failed to give any local relief. The next day the temperature was still high, swelling in the knee region was quite evident and the pain continued. I saw her in consultation then and believing that she had an acute osteomyelitis of the lower end of the femur, she was removed to the hospital immediately.

Her past history was rather interesting. She had measles and scarlet fever in infancy and since then has had running ears, for which she has received irrigations. Six years ago Dr. Luckett removed her gallbladder for hydrops. Two years ago she had a fracture of the right clavicle. One

month before the present illness she had chicken pox, with an apparently uneventful recovery.

Dr. Allen O. Whipple, called in consultation, agreed with the diagnosis of osteomyelitis. Two lateral incisions were made over the lower end of the thigh and a large subperiosteal abscess was evacuated. The wound was dakinized. The patient had immediate improvement, but in 24 hours her temperature went up again and she began to have pain and swelling over the lower radial aspect of the right forearm. This was watched for about 10 hours and it was then decided that she probably had another focus just above the epiphysis of the lower end of the right radius. Under gas and oxygen anesthesia a 7 cm. incision was made over the lower end of the radius posteriorly. The tissues were found edematous, as was also the periosteum, but there was no subperiosteal abscess. Despite this fact the periosteum was split and the wound was dakinized. The pain disappeared and the temperature came down. Twenty-four hours later her temperature went up again and she developed a swelling over the left side of the lower jaw, which was quite painful and very tender. This spread to the entire face and practically closed her eyes. This was watched for 24 hours and then at a point at which it was thought pus might be obtained a 7 cm. incision was made parallel to the jaw. The subcutaneous fat was hard, and just outside the periosteum there were a few drops of pus. This wound was dakinized. It was at this point that the patient became very sick. She had temperature up to 105° and was delirious; and it was felt that she would probably die.

The bacteriological phase of this case is very interesting. A culture from the three wounds showed staphylococcus aureus. A blood culture taken before the first operation was negative. A blood culture 4 days after the last operation grew staphylococcus aureus, non-hemolytic. This, however, was not reported until 3 days after it was taken. The patient was then given 3 mgs. of gentian violet per kilo of body-weight in a .25% solution. However, before injecting it another blood culture was taken through the same needle through which she got the gentian violet. The patient made an immediate remarkable improvement. Within 12 hours her temperature was lower and she was rational. Her general condition was much improved. Now comes the interesting point, namely, that the blood culture taken immediately before the injection of gentian violet was reported negative. This is another instance to show how guarded one must be in attributing improvement to therapy.

The patient left the hospital on August 8, 1924, with wounds discharging from femur, radius and jaw. Her general condition was good. She was dressed by her family physician, Dr. Morris Fink, who reported to me that she passed many small sequestra from all three bones. On January 17, 1925, I removed a large sequestrum from the femur and one from the radius. The wound of the jaw is completely closed; the others are closing. The patient is ambulatory on a Taylor splint.

Conclusions: This young girl is shown as a case recovered from a severe multiple osteomyelitis with three foci which were operated on within 72 hours. In addition the case demonstrates an improvement following intravenous dye medication which cannot be attributed to this therapy inasmuch as her blood culture had already become negative.

Discussion

Dr. Robert Morris: I would like to ask Dr. Carp whether he has lost confidence in vaccines. Where I have used autogenous vaccines I have not always gotten results of consequence, but I have obtained apparently better results with mixed vaccines, which include the dominant species found in any given case.

Dr. Edwin Beer: I would like to ask Dr. Carp why he did not open the medulla.

Dr. Carp: I have had no experience with the use of vaccines in acute osteomyelitis and so cannot say that I have lost faith in their efficacy. With regard to Dr. Beer's question as to why the medulla was not opened, one reason is the excellent early end-result. We left the bone itself alone to form sequestra, and were inclined not to enter the cortex or medulla in order to avoid traumatizing more tissues and opening up new avenues of infection. The end-results that I have seen in children with similar conditions and treated in this way have been good.

PENETRATING ULCER OF LESSER CURVATURE OF STOMACH WITH INTERESTING SYMPTOMS. RESECTION.

Dr. Louis Carp

A married man of 63, a clerk, born in Germany, complained that for four weeks he had severe pain in the upper abdomen radiating to the back. He had had no gastrointestinal symptoms until then. The pain had no relation to meals. It was knife-like in character and seemed to shoot straight through the back. It was severe enough to double him up and make him moan, and occasionally would come on in the middle of the night. He had not vomited, but had felt nauseated and his appetite had been very poor. He lost eight pounds in four weeks: his bowels were regular and he noticed no blood in his stools. There had been no fever. He was a very thin and nervous man, visceroptotic, and with a point of exquisite tenderness in the epigastrium just to the right of the midline. There was also some spasm. No masses could be felt. This patient had been under medical treatment since the onset of his illness and clinically he presented a picture of carcinoma of the stomach. *X*-ray films showed a distinct niche on the lesser curvature at just about the incisura. There was gastric retention after six hours. Inasmuch as he had not been improved under medical treatment and because he was having severe pain, especially with the suspicion of carcinoma, a laparatomy was advised.

Under gas and ether anesthesia, through a median epigastric incision it was found that there was a small penetrating ulcer at the incisura with very little reaction around it. This ulcer subsequently proved to be about 2 cm. in diameter and with very little fibrous tissue reaction. It was decided to do the least possible amount of surgery because the patient was not behaving well on the table. A wedge-shaped resection of the ulcer was made and a lateral anastomosis of the openings of the stomach. A gastroenterostomy was not done, both because it was necessary to make the operation as brief as possible, and to avoid the possibility of a gastrojejunal ulcer, inasmuch as the acid-bearing area of the stomach had been left behind. It was realized, however, that the patient would probably have interference with gastric motility as a late result of the operation performed. The abdomen was closed in layers.

The patient made an uneventful recovery until the 10th day when he had a disruption of his wound and a part of the left lobe of his liver and a knuckle of small gut came in contact with his dressing. Under general anesthesia a few heavy silk through-and-through sutures were inserted. His wound healed in about one month with very poor granulation tissue and it was explained to the patient on discharge that he probably would have a ventral hernia. Three days after his second operation he developed a broncho-pneumonia, which cleared up.

In following this man's case, I find that he was perfectly well and could eat everything until about 6 weeks ago. He volunteers the information that then he could not eat an orange, veal, or white bread without epigastric distress and sour eructations. An *x*-ray picture of his stomach taken one week ago shows the pylorus drawn over nearer to the lesser curvature but, strangely enough, good emptying time of the stomach. He has a small ventral hernia.

Conclusions. This patient is presented not to advocate the type of operation that was done, but to elicit some discussion concerning the acuteness of the symptoms, considering the lesion that was found at operation.

Discussion

Dr. John F. Erdmann: Many ulcers of the lesser curvature are absolutely symptomless, as far as the stomach is concerned. With regard to the question of resection in these cases, I have done that time and again with no bad results. The difficulty is in the closure of the large wound.

I do not see why the motility of the stomach should be disturbed because a certain portion is.

DR. BURRILL CROHN: The most interesting point in this case relates to the duration of the ulcer. How much time does it require for a callous ulcer of the stomach to be formed? When Professor Aschoff, of Freiburg, was recently in this city he said he thought that callous gastric ulcers could form within a few days, if not within forty-eight hours. We had recently, at Mount Sinai Hospital, a case in which careful roentgenographic studies previously made at a reputable institution in this city, failed to show a lesion, yet three weeks later films showed a penetrating ulcer on the lesser curvature. There seems to be no question that such an ulcer had formed within three weeks and it seems not improbable that most ulcers form quickly and assume their maximum dimension within this time, later increasing only in depth. Such callous ulcers show a definite tendency to healing in the intermission periods and presumably disappear completely when the patient feels and is well, breaking down again rather quickly with recurrence of symptoms.

The reason that one occasionally hears of "silent ulcers," is that a small percentage of ulcer patients are really insensitive to pain. On cross-examination they will admit to occasionally having mild gastric disturbances, but these are of such a mild type, and the patient is so insensitive to painful stimuli, that no attention is paid to the few gastric complaints from which he suffers.

DR. CARP: With regard to the motility of the stomach in ulcer of the lesser curvature, it has very frequently been observed that in such cases there is a spasm of the pylorus, which simulates very closely an organic pyloric obstruction. I think that the end-results of wedge-shaped resection in the hands of most men have been very unsatisfactory, and I do not think that it is being done in the larger clinics except, as in my case, through necessity. Dr. Eugene Klein has carried out some very interesting experiments at the Columbia University College of Physicians and Surgeons on gastric motility in various types of operation. His work is about ready for publication. He has come to the conclusion that there is a real conduction system on the lesser curvature and pace-makers at the cardia and reentrant angle. When this system is interrupted by an operative procedure on the lesser curvature only, there will be interference with gastric motility if this is not compensated for by such a procedure as gastroenterostomy.

SITUS INVERSUS VISCERUM.

DR. MATHER CLEVELAND

The speaker presented the cadaver and photographs of a case of *situs inversus viscerum* which was discovered at the medical school three years before by one of the students who was dissecting the body and who noticed that the left common carotid and subclavian arteries had a common trunk of origin. Dr. Cleveland finished the dissection himself and found complete inversion of the viscera. The subject was the body of a patient which came from one of the large hospitals in this city and the condition had been recognized and studied from the clinical aspect.

Situs inversus is now generally regarded as less rare than it was formerly supposed to be, but it is still an infrequent finding. Roentgenologists see a larger number of instances than do clinicians or anatomists. The specimen presented is the first seen in the anatomical laboratory of Columbia University College of Physicians and Surgeons among about 10,000 subjects examined in the last forty years in routine dissection. The condition seems to be due to some unknown factor operating at a very early stage of development. The theories of the etiology of *situs inversus* relative to abnormalities of the abdominal veins cannot satisfactorily explain the condition because these variations develop after reversed asymmetry of the viscera has been determined. While *situs inversus* sometimes occurs in dicephalic monsters, it is not a constant finding and does not occur in duplicate twins. The most interesting experimental work on the subject was done by Spernan and Pressler. Working with Rana and Bombonator they excised a square of the medullary plate with a portion of the primitive gut and rotated it 180° so that the original cephalic end was placed caudad. A number of these embryos developed *situs inversus*. These results indicate that the factors for normal asymmetry of the viscera are present at a very early stage and that some distortion of these factors might result in a reversal of asymmetry.

Discussion

DR. JOHN F. ERDMANN: Recently the daughter of a physician was brought to me for operation for appendicitis. I opened the abdomen and was proceeding with the operation but found trouble in locating the cecum when her physician for the first time volunteered the information that her heart was on the right side. The appendix was located in the left side and removed without trouble. Then an examination disclosed the fact that there was complete transposition of all the viscera. The liver was on the left side and the sigmoid on the right.

DR. CHARLES E. FARR: I saw a man who had entered the New York Hospital in April 1923 complaining of agonizing pain in the epigastric region. He had had vague gastric symptoms for some months. The diagnosis was obviously a perforated ulcer of the stomach. Physical examination revealed very faint heart sounds in the left chest, and stronger sounds in the right. The diagnosis of *situs inversus* was made and was confirmed by fluoroscopic examination. Dr. Gibson operated through a left rectus incision deliberately planned to expose the pylorus in the left hypochondrium. An ulcer three-quarters of an inch in diameter was found in the prepyloric region with a perforation one-half inch in diameter. The perforation was closed by suture and the patient made an uninterrupted recovery. This is apparently the first case on record which the diagnosis of perforation of a gastric ulcer in *situs inversus* was made before operation, and the proper incision made for its exposure.

DR. LEON T. LEWALD: I have studied personally 29 cases,—28 roentgenographically, and the other one post-mortem. I do not believe the condition is so rare as is supposed. The question of etiology is a very interesting one. Where we see one anomaly we may assume there are others present, but that is not true except as a coincidence in transposition. In the group of 29 cases, 21 were males and 8 females; the average age was 30 years and the youngest was 4 months when observed. They are more frequently observed on *x*-ray examination than by any other method of examination. Many of the cases I have observed had been recognized clinically. One case had been operated on by Dr. Lyle for appendicitis; he knew of the condition and made his incision on the left side. But they are not always recognized on routine physical examination; the last two of my cases had been through a routine physical examination but the transposition was not recorded in either case. As to the relative frequency; 1 in 1400 has been observed in *x*-ray examination; 1 in 5,000 necropsies; 1 in 10,000 in the dissecting room, and 1 in 35,000 on physician examination. As to the etiology, one has to assume it is due to some factor in the development at a very early stage. I believe in the duplicate twin theory, although that has many opponents. To me the finger-print evidence is quite conclusive; in the duplicate twins there is found a reversal of the finger print pattern with the same number of lines and whorls. If a certain method of subdivision of the ovum obtains the organs of one of the twins will be transposed, all of the structures of the body being reversed. The other twin becomes absorbed in the first individual or the other portion of the ovum is probably destroyed and only one individual is born with transposed viscera.

DR. LOUIS CARP: I had a case three years ago, a woman who complained of hoarseness and who on clinical and *x*-ray examination was found to have complete *situs inversus*. The laryngologist to whom she was sent thought the hoarseness was an hysterical condition. I should like to ask Dr. Cleveland whether there might have been a relation between the reversed position of the recurrent laryngeal nerve as it passes under the aortic arch and the hoarseness.

DR. CLEVELAND: Regarding the frequency of this condition I think that there are many cases that have not been reported. There have been only about 400 cases in the literature. What Dr. LeWald said about the pattern of the finger prints of twins is very interesting. In dicephalic monsters there may be reversal of one component but this is not the same thing as duplicate twinning.

CARCINOMA OF RECTUM. COMBINED ABDOMINO—PERINEAL RESECTION WITH PANHYSTERECTOMY

DR. PAUL KURT SAUER

A married woman of 45, was first seen in April, 1924. For nine months she had been complaining of constipation, pain on defecation, and ribbon-like stools, sometimes stained with blood and mucus. She had lost about 15 pounds in weight, and kept to fluid diets because of the painful bowel movements.

Physical examination was practically negative except for a mild secondary anemia, and a mass, the size of an egg, about two inches from the anus, confined to the left postero-lateral surface of the rectal lumen. It was freely movable. An ulcer about the size of a quarter was felt on the surface of the mass. Although advised to have the mass removed at an early date, she did not return until July. By this time the tumor had increased to the size of an orange.

On July 16th a left inguinal colostomy was made through a pararectal incision. On August 4th through a median incision a hysterectomy was done followed immediately by a resection of the lower sigmoid and rectum, including the anus, according to the technique described by Miles in the *British Journal of Surgery*. The hysterectomy was done because the upper part of the posterior vaginal wall and the lower end of the uterus seemed involved in the tumor. The abdominal wound and the incised portion of the perineum, to the drain, healed by primary union. The pathological diagnosis, made by Dr. Bullock, was adenocarcinoma.

For thirty-six hours after the operation the patient was in a bad state of shock, but from that time on she made an uneventful recovery. Since her discharge she has gained about thirty pounds in weight and is working without any discomfort.

(No Discussion)

CHRONIC INTESTINAL OBSTRUCTION CAUSED BY GALLSTONE IN ILEUM

DR. PAUL KURT SAUER

A laundress, 65 years of age, was admitted to the medical service of the Lenox Hill Hospital on June 9th, complaining of inability to move her bowels for four days. Two weeks previously she had vomited a brownish, slimy fluid together with castor oil which she had taken a few minutes before. On account of pain in the epigastrium she applied a mustard plaster but the pain continued for about six hours, and was not relieved until she took some pills which a physician gave her. Previously, she had always been well except for occasional gaseous eructations; her appetite was good, and she had never been nauseated. There had been no loss of weight.

The physical examination showed a slight myocardial insufficiency, a protuberant, slightly distended abdomen, with an apparently enlarged liver which was tender along the lower edge.

The blood count showed 3,490,000 red cells, 75% hemoglobin, and a normal total and differential white cell count. The blood pressure was 145/80. On admission there was a slight trace of albumin and some casts in the urine, but these were not found at later examinations. There was no rise in temperature at any time.

Roentgenograms showed a persistent deformity of the first portion of the duodenum and a diagnosis of duodenal ulceration was made. Treatment consisted of enemata and mild laxatives, and on July 7th she was discharged with the diagnosis, chronic cholecystitis.

On December 7th she was readmitted complaining of continuous abdominal cramps for two days. She could retain no food, and although the vomitus was dark it had no foul odor. She had had several similar attacks since her discharge from the hospital in July. Her abdomen was somewhat distended, but she passed gas and feces with enemas. On December 12th more roentgenograms were made. Two days later she vomited fecal matter, and a diagnosis of carcinoma of the ileo-cecal junction was made.

At operation the large intestines were found to be normal, the small intestines slightly distended, but the walls were much hypertrophied. The gallbladder region was a mass of adhesions. About a foot from the ileo-cecal junction, in the ileum, a hard mass was felt, and on delivery of the loop, it was assumed to be a gallstone. The contents of the gut were stripped to either side, clamps applied and the stone removed. The patient made an uneventful recovery, and was discharged on the seventeenth day.

Discussion

DR. JOHN ERDMANN: This subject came up recently before the New York Surgical Society and general astonishment was expressed at the infrequency with which these cases are reported. I have had seven or eight cases of obstruction from gallstones, in size from that of an English walnut to that of a peach.

DR. OTTO CARL PICKHARDT: Gallstones cause 2% to 4% of all cases of intestinal obstruction. I have seen six cases, one of which I operated on. The question of diagnosis is very interesting because it is doubtful if many surgeons would make it the primary diagnosis. Occasionally *x*-ray examination without bismuth will show a large shadow. The one constant symptom in my six cases has been recurrent attacks of obstruction and diarrhea comparable to that of carcinoma of the large intestine.

DR. ABRAHAM J. BELLER: This condition is not a rare one. I have seen 9 cases in the last ten years. I think these stones are sometimes passed per rectum. I remember two such cases. It is easily understood why this condition should be mistaken for gastric ulcer. The gallbladder becomes adherent to the duodenum, forming a fistula through which the stone is discharged into the intestinal tract. Dr. Moschcowitz operated on a case in which a stone was passed per rectum and found a fistula between the gallbladder and the duodenum. In one case I palpated a stone in the ileo-cecal region before operation. These patients have symptoms for a few days referable to either stomach or gallbladder before the stone enters the intestinal tract, then symptoms of intestinal obstruction.

Dr. Robert T. Morris read a paper on Factors Having a Death Rate of Their Own in the Surgery of Appendicitis, which has been published in *The American Physician*.

Dr. Joseph Franklin Montague presented A New Recto-Sigmoidoscope, description of which has been published elsewhere.

A CORRECTION

In the editorial announcement concerning the publication of the Transactions of the Section of Surgery of the New York Academy of Medicine, which was made in the December issue of the JOURNAL, the statement "The meetings of this important group of about four hundred active surgeons have never before been reported in print," should have read, "..... have not for some years been reported in print." These meetings were reported for several years in the *Medical Record*.

American Journal of Surgery
PUBLISHED BY
SURGERY PUBLISHING CO.
Established by J. MacDonald, Jr., M.D.

ADMINISTRATION AND EDITORIAL OFFICE
15 EAST 26TH ST., NEW YORK, U. S. A.,
where all communications intended for the Editor, original articles, books for review, exchanges and business letters should be addressed.
Publication Office: 425 Carroll Street, Elmira, N. Y.

SUBSCRIPTION PRICE, TWO DOLLARS
FOREIGN, TWELVE SHILLINGS

Original Articles and Clinical Reports are solicited for publication with the understanding that they are contributed exclusively for this journal.
It is of advantage to submit typewritten manuscript; it avoids errors.
CHANGE OF ADDRESS. Subscribers changing their address *should immediately notify us of their present and past locations. We cannot hold ourselves responsible for non-receipt of the Journal in such cases unless we are thus notified.*
ILLUSTRATIONS. Half-tones, line etchings, and other illustrations will be furnished by the publisher when photographs or drawings are supplied by the author.

SPECIAL NOTICE TO SUBSCRIBERS
The American Journal of Surgery is never sent to any subscriber except on a definite written order. Present and prospective readers please note this.

WALTER M. BRICKNER, B.S., M.D., F.A.C.S., *Editor*
New York City

ELMIRA, N. Y., FEBRUARY, 1926

CANCER

For several years the Welfare Division of the Metropolitan Life Insurance Company, under the direction of Dr. Lee K. Frankel, has been conducting, through nursing service and educational pamphlets, an active health conservation campaign among its policy-holders, which has undoubtedly been reflected in lowered death rates in the community at large and which, indeed, deserves ungrudging recognition as one of our most helpful public health movements. In terms of dollars and cents it has effected for the Company a saving of over $40,000,000 in death claims. It has reduced the mortality from diphtheria, pneumonia, tuberculosis, child-bearing, and childhood diseases among its policy-holders further than the reduction in the general community. It does not appear, however, to have had any effect upon the mortality from cancer.

Recently the Statistical Bureau of the Company published a study of Cancer Mortality Among Insured Wage Earners and Their Families from 1911 to 1922. These statistics are of particular value for they refer to millions of policy-holders in the United States and Canada, of all walks of life, of all ages and of both sexes. From the summary of this study we quote:

1. Cancer was the fifth cause of death in numerical importance, during the period of 1911 to 1922, being outranked only by heart disease, tuberculosis, Bright's disease and pneumonia.

2. During the last two years of the period the relative rank of cancer as a cause of death was higher than in the prior years. In 1921, only heart disease and tuberculosis had higher death rates.

3. If a boy or girl once reaches the age of ten there is more likelihood of dying ultimately from cancer than from tuberculosis, or pneumonia. Heart disease, chronic nephritis (Bright's disease) and cerebral hemorrhage (apoplexy) are the only diseases which are more likely than cancer ultimately to cause the death of a male who has once reached the age of ten years; and only heart disease and cerebral hemorrhage are more likely to cause the death of a female who has already lived ten years. Of 100 boys ten years old, the probability is that more than eight will eventually die of cancer. Of 100 girls ten years old more than eleven will eventually succumb to cancer.

4. One dollar in every eleven disbursed in death claims by the Metropolitan Life Insurance Company is paid out on account of cancer. Tuberculosis and heart disease are the only diseases responsible for greater disbursements than is cancer.

5. The mortality from cancer has increased in the industrial population of the United States and Canada during the twelve years studied.

These facts, the statistics from which they are taken, and the statistics from many other sources here and abroad, are eloquent of the magnitude of the cancer problem that challenges the civilized races. This year, as in the years preceding, The American Society for the Control of Cancer has stressed the importance of educating the public to recognize the early (*sic*) symptoms of cancer and to seek prompt treatment by surgery or radiotherapy. That is all very well as far as it goes. But *how far does it go?* Except the obvious neoplasms on the surface of the body, what cancers give symptoms "early" enough to offer an assurance of cure by surgery or by radiation or by both together? Cancer of the breast is a relatively superficial and readily palpable growth; women are mortally afraid of it; thousands of them watch for it fearfully; and yet, even among these, how often is a mammary carcinoma not diagnosed—nor even observed—before the lymphatics have become involved? And when the axillary glands are invaded how many cures have been effected, how many years have lives been prolonged, by radical operations or/and by radiation? When a rectal cancer first causes bleeding or pain or mucous discharge is it "early" enough to be cured? How "early" may a cancer of the stomach be recognized, and what are the results of the treatment of the most early diagnosticable gastric neoplasms? Carcinoma of the body of the uterus and of the intestine above the sigmoid are relatively favorable, but what are the accomplishments of surgery or radiotherapy in cancer elsewhere in the pelvis or abdomen, or in cancer of the larynx or the tongue? So far as surgery is concerned there are available statistics of the percentage of cures of cancer of the various organs and tissues. They are not brilliant. *X*-radiation profoundly influences malignant masses but, aside from skin cancer and, sometimes, cervix cancer, how often does it cure?

How often does it stay the progress of a neoplasm; how often, does it, indeed, stimulate the growth? Has it been demonstrated that radiation improves the results of surgical extirpation, if applied pre- or post-operatively? How many cures of osteogenic or visceral sarcoma have been effected by any form of surgical or radiation treatment? These are the only remedies of proven worth in the treatment of cancer; we would not belittle the importance of applying them as early as possible, nor the desirability of educating the public in cancer symptomatology. We do not believe, however, that such education will materially improve our results with these remedies.

The responsibility can not be shifted to the public. Cancer is a challenge to science. It is a challenge to the public only to support science in the pursuit of the problem. And the challenge is being met by scientists, and by the public, each in their sphere. Through private and through state grants, malignant neoplasia is being intensively studied in various laboratories and clinics throughout the civilized world. Now here, now there, some patient toiler into the night brings forth an observation that takes us a bit nearer the goal. In 1925 our English cousins recorded what appears to be the most important discoveries. Last summer Gye and Barnard published their finding of an ultramicroscopic organism which they believe to be the cause of certain experimental tumors when combined with a so-called "specific factor"; and this has probably opened a new line of investigation. W. Blair Bell, the distinguished gynecologist of Liverpool, has been treating malignant growths with intravenous injections of colloidal lead; and he says he had a notable percentage of what appears thus far to be cures even in some quite advanced cases. These results are to be, or by this time have been, published in *The Lancet*. As stated in his recent Toronto address, published in the November 14th issue of that journal the hypothesis upon which Bell and his co-workers developed the treatment is.

> .....that malignant neoplasia is a specific growth process in that it is a reversion on the part of the starving cell to the nutriment-seeking proclivities of its ancestral type, the chorionic epithelium.
>
> A comparison between the chemical constitution of different tissues in regard to the factors concerned in growth processes demonstrates clearly not only that malignant tumors are richer in this respect than the corresponding normal structures and innocent neoplasms of the same parts, but also that the physiologically malignant chorionic villi show even higher value than pathologically cancerous tissues. The chorionic epithelium is super-malignant.
>
> In the search for a substance that will arrest or have a specific lethal action on cells which possess the chemical constitution associated with malignancy we have found only lead. This metal is specifically active in regard to the chorionic epithelium, to the cells of cancerous growth, to normal embryonic growth, and to mature cells rich in phosphatides.
>
> Some day we hope that a substance, less toxic to the organs of the patient that are rich in phosphatides, and even more effective than lead in arresting and destroying cancerous tissues, will be found.

The elusive solution to the cancer riddle is not yet within our grasp, but perhaps it is "only around the corner!"

Progress in Surgery

Selections from Recent Literature

Certain Diseases and Injuries of the Spine in Adults. E. W. RYERSON, Chicago. *Southern Medical Journal*, January, 1926.

Backache in adults is most commonly caused by osteoarthritis due to infective foci in teeth, tonsils, or elsewhere. Strains or sprains of arthritic vertebral joints may cause sudden acute attacks of pain. Removal of foci may give relief. When the lumbo-sacral joint is involved, especially in cases with an exaggerated lumbar lordosis, relief may be obtained by an operation fusing the fifth lumbar vertebra to the sacrum. The same operation is applicable in cases of pain due to a large sacralized fifth lumbar transverse process, and gives better results than an attempt to remove this process.

Malignant new growths are occasionally seen in the spine, and tuberculous spondylitis is relatively common. Differential diagnosis may be very difficult, and is of great importance. *X*-ray appearances may be characteristic, but borderline cases occur. In tuberculosis, the intervertebral disks are usually involved, while in cancer they may remain intact for a long period. An ankylosing operation is the best treatment in spinal tuberculosis in adults. Fractures with paralysis should be operated upon as early as possible.

Lipiodol in Neurosurgery. A Report of a Case with Deleterious Results. A. S. MACLAIRE, New York City. *The American Journal of the Medical Sciences*, December, 1925.

Lipiodol—a 54% solution of metallic iodin in a vegetable oil—is almost nonabsorbable.

A case is reported wherein the intraspinal damage was definitely increased, owing to the use of lipiodol. It is irritating if left within the subarachnoid space an indefinite period of time.

It is advisable not to employ this new material as a means of localization, except as a last resort and only if laminectomy is to follow within a few days. The oil should then be removed from the intradural space.

Generalized Tuberculous Adenitis with Report of a Case. LEO H. CRIEP, Pittsburgh, Pa., and FRED C. NARR, Kansas City, Mo., *The American Journal of the Medical Sciences*, December, 1925.

A case of generalized tuberculous adenitis without any visceral tuberculosis is reported. It is getting progressively better and is of two years' standing. The condition may easily be confused with Hodgkin's disease but biopsy and bacteriologic study will settle the diagnosis. A review of the literature discloses but few such cases. There is no explanation as to how the glands may become involved in such process without the viscera.

Toxic Goiter: Its Treatment by Means of Radium and the Roentgen Rays: Results Controlled with Basal Metabolism Tests. J. THOMPSON STEVENS, Montclair, N. J. *Radiology*, January, 1926.

The technic and the results obtained are outlined.

Radium and the roentgen rays will probably cure from 66 to 75 per cent. of cases of toxic goiter. The results are at least equal to those obtained by any other method of treatment.

Patients with large tumors, who present symptoms of pressure, ought to be operated on for quick relief. If normality in all respects is not realized, irradiation can be expected to perfect conditions in many instances.

Chronic abscesses or foci of infection should be eradicated in each case of toxic goiter.

The Treatment of Abscess of the Lung. JAMES ALEXANDER MILLER and ADRIAN V. S. LAMBERT, New York. *The American Journal of the Medical Sciences,* January, 1926.

This later paper is based on a third series of 40 cases, making 100 in all. The operative mortality in the last series was 20%. The authors conclude: 1. The successful treatment of cases of abscess of the lung is materially aided by their joint management by internist and surgeon, with the close cooperation of a skilled bronchoscopist.

2. A systematic plan of prolonged rest, combined with postural drainage, is the basic method of treatment. Into this plan the other methods may be advantageously introduced in properly selected cases.

3. Bronchoscopy is of real value as an aid to drainage in certain cases. Artificial pneumothorax has a very limited field of usefulness.

4. Approximately from 40 to 50 per cent of all cases will eventually need radical surgical treatment. Correct judgment of the indications for operation is the crucial element in successful treatment. In general, it is based upon the avoidance of surgical intervention during the acute phases of the disease but without delaying too long and thus allowing the case to drift into the chronic stage.

The Oral Administration of Sodium Tetraiodophenolphthalein for Cholecystography. JULIUS BRAMS, KARL A. MEYER and WILLIAM A. BRAMS, Chicago. *Radiology,* January, 1926.

A series of a hundred cases was examined following the oral administration of sodium tetraiodophenolphthalein.

Wide variations in size, shape and position of the normal gallbladder were noted.

Many unusual pathological cases were diagnosed by this means, including chronic infections, adhesions, stones, and lesions in adjoining organs.

Forty-three cases of this series were proven at operation to correspond with the roentgenologic diagnosis, and the remaining fifty-five corroborated the clinical diagnosis. In two surgically proved cases our diagnoses were wrong.

All untoward effects have been eliminated by reducing the dose to about fifty grains instead of eighty.

Cholecystography is a definite advance in the diagnosis of gallbladder disease; the method is practical and should be carried out routinely.

Physiological Study of a Pancreatic Fistula. (*Etude physiologique d'une fistule pancreatique.*) MAURICE VILLARET et L. JUSTIN-BESANCON, Baugon. *Archives des Maladies de l'Appareil Digestif,* Vol. XV, No. 8, 1925. 1925.

In the course of a Polya operation for the removal of a gastric ulcer, the pancreatic duct was apparently unwittingly injured. A week later a pancreatic fistula developed. The authors took advantage of this unusual opportunity to study the chemistry and the influence on closure of such a fistula by various methods. They come to the conclusions that a fistula of the canal of Wirsung is associated with a considerable diminution in the assimilation of nitrogen, phosphorous and sulphur, without any influence on the internal secretory function of the pancreas. The secretion of such a fistula contains no invertose, but its trypsinogen and lipase are partially activated. Insulin does not appear to modify either the quantity or the quality of the secretion; atropin has only slight value in diminishing the amount of the secretion, and an antidiabetic diet did not exercise any influence on the closure of the fistula.

There appear to be two sorts of pancreatic fistulae: 1, those associated with pancreatic cysts, or fistulae of the accessory canals; 2, a fistula of the canal of Wirsung. Those belonging in the first category appear to be favorably influenced by atropin and antidiabetic diet, while those in the second category show no response to nonoperative treatment. For these latter fistulae it appears to be necessary to liberate the duct and transplant it directly into the small intestine. Following this procedure the patient here reported made an uneventful recovery.

Observations on the Diagnosis of Subphrenic Abscess. RICHARD DEXTER, Cleveland, O. *The American Journal of the Medical Sciences,* December, 1925.

The cases studied emphasize the fact that subphrenic abscess is of insidious onset, and that early diagnosis is infrequent. On account of the lack of physical signs pointing directly to the subdiaphragmatic location of the infection, the condition is often confused with some postoperative inflammation within the thorax. In each of the cases reported there was dulness, diminished breathing and diminished or absent fremitus on the affected side; in 5 of the 6 cases adventitious sounds pointing to involvement of the pleura, or of the lung, were noted. In only 3 of the 6 cases was the outward movement of the costal margin exaggerated, as would be expected to be the case were the diaphragm in a higher position than normal. In only 3 cases was the liver displaced downward, as would be expected when a collection of pus lay between the liver and the diaphragm. Therefore these two signs, which when present are important evidence of subphrenic abscess, cannot be depended upon in all cases. The particular subphrenic location of the abscess will determine the presence or absence of these signs. If the abscess be in a position which will cause adhesions between the anterior surface of the liver and the costal margin, then neither of these signs will be present, because the liver will be firmly fixed and, therefore, cannot be displaced downward; on account of its fixation to the liver the costal margin is held immobile. A succussion sound and shifting dulness should always suggest the presence of subphrenic abscess, but these signs are not constant. They were observed in 3 of the 6 cases.

The Roentgen-ray examination in all 6 cases showed that the diaphragm was displaced upward, was more acutely arched than normal and that diaphragmatic motion seems to be chracteristic of subphrenic abscess. Other conditions which enlarge or displace the liver upward may affect the position of the diaphragm, but in such conditions, while the movements of the diaphragm may be limited, they are not lost. It is reasonable to suppose that this loss of motion of the diaphragm in subphrenic abscess is analogous to the "splinting" of the abdominal muscles in intraabdominal inflammation. Involvement of the pleura and lung may be made out earlier by the Roentgen ray than by physical examination. Of course, the value of the Roentgen-ray examination will be vitiated if the process in the lung or pleura be so far advanced as to make a clear observation of the diaphragm impossible. While clinical observation and examination should lead one to presume the presence of a subphrenic abscess in all cases, and should enable one to definitely assert its presence in a certain proportion of cases, yet earlier and more positive evidence is to be looked for in the results of the Roentgen-ray examination.

It is highly desirable to drain the abscess before the structures above the diaphragm are involved. It is striking to note how seldom a diagnosis is made early enough to accomplish this. An early diagnosis of subphrenic abscess can be established only by constant watchfulness for the appearance of this insidious condition and by repeated clinical and roentgenologic examinations.

Traumatic Anemic Necrotic Liver Infarct following Subcutaneous Rupture. (*Traumatisch-anämisch-nekrotischer Leberinfarkt nach subkutaner Leberruptur*). W. STEIGER, Wieden. *Wiener klinische Wochenschrift,* December 3, 1925.

The author reports a case of a 40-year old man who was kicked in the stomach by a horse, and gave all evidence of internal hemorrhage with visceral injury. On exploratory laparotomy a mesenteric tear was found and sutured. The patient died and at autopsy a deep injury to the liver was found, just beyond a large area of necrotic infarct. This was explained as being due to a severance of the main arterial and venous supply.

A review of the symptomatology is given, with a discussion of the unusual type of infarct which may follow

injury to the main hepatic vessel. Following such a trauma, the infarct may be completely absorbed and cicatrized, or may go on to the formation of liver abscess, cyst or aneurism of the hepatic vessel. This type of infarct is rather infrequent in the liver, because of its extensive vascular supply, and must be explained as due to a simultaneous injury to both sources of supply.

(Left) Shoulder Pain of Phrenic Origin—A Reflex Symptom in Chronic Appendicitis. IRVING GRAY, Brooklyn, N. Y. *The American Journal of the Medical Sciences,* December, 1925.

Spasm of the pylorus associated with chronic appendicitis leads to increased gastric pressure. The mechanism by which the pain is referred to the left shoulder region is brought about by a pylorospasm, increased intragastric pressure, upward pressure upon the left diaphragm and irritation of the phrenic nerve. In its origin the phrenic nerve is in communication with the descending branches of the cervical plexus. These branches become cutaneous near the clavicle. Thus we see how pain in the left shoulder region may occur when the left phrenic nerve is irritated as a result of reflex pylorus spasm in chronic appendicitis. Three cases are reported.

A Method of Radical Cure of Femoral Hernia. R. H. CRISSEY, Lansing, Mich. *The Journal of the Michigan State Medical Society,* January, 1926.

A slightly curved incision is made concavely outwards, beginning about an inch above Poupart's ligament and extending downward over the hernial protrusion two inches below Poupart's ligament. An angular incision may be made, the two limbs of the incision coming to a point just above the hernial protrusion. The incision is carried down through the skin, superficial and deep fascia and the sac is sought for in the usual manner. The sac is opened, its contents are reduced and the sac is ligated as high as possible. The lower portion of the incision is now deepened down to the pectineus, which should, if possible, be parallel with its fibers. Here we will be apt to meet the pudendal arteries which may be tied. By blunt dissection, the fat over the pectineus muscle is wiped away and a strip of the pectineus fascia is now outlined parallel with its fibers and left attached to the pubic bone directly under the femoral canal. This flap is usually made about one-half inch wide and one to one and one-half inches long. This, of course, should be made according to the size of the femoral canal. This strip of fascia is now raised and dissected well up to its attachment. The opening left can be closed with two or three interrupted sutures. A curved director or a rather sharply curved hemostat is now introduced into the femoral canal in front of the sac extended up between the parietal peritoneum and Poupart's ligament and is made to point about one-half inch above the ligament. This point can be felt just beneath the aponeurosis of the external oblique muscle. A small incision is now made parallel to the fibers of the external oblique aponeurosis directly over the point of the protruding director and the director is shoved through. By grasping hold of the director with a small hemostat, the latter is made to retrace the path of the director, bringing the point of the hemostat from above downward beneath Poupart's ligament and anterior to and below the peritoneal reflection, down through the femoral canal. The strip of fascia which was previously raised, is now caught and pulled upward, completely closing the femoral canal. A couple of stitches will now fix the strip of fascia to Gimbernat's ligament, also Poupart's ligament. The fascia is now caught by a couple of stitches which at the same time closes the rent in the external oblique aponeurosis and completely fixes the fascia. The incision is closed in the usual manner.

The Ilio-Hypogastric Nerve in Relation to Herniotomy. EDMUND ANDREWS, Chicago. *Annals of Surgery,* January, 1926.

Andrews' experiments in vivo show that the ilio-hypogastric nerve is motor to the lower fibers of the internal oblique muscle, but all the motor fibers are given off before the nerve enters the field opration for hernia, and, therefore, accidental section of this nerve will not cause any paralysis of this muscle.

Renal Tuberculosis in the Infant. (*La tuberculose rénale de l'enfant*). EMILO FALCI, NAPLES. *Journal d'Urologie,* Vol XX, No. 4, 1925.

The author has studied fifty cases of renal tuberculosis occurring in the infant and reviews the work of other observers. He comes to the conclusion that as a general principle renal tuberculosis is more frequent in the adult than in the infant, and that the incidence increases with age. When tuberculosis does appear in the infant, it is more apt to be bilateral than in the adult, in whom most frequently it is unilateral. Bilateral renal tuberculosis occurs in only about 28% of cases in children, and in 14.1% in the adult.

In the infant the evolution of bilateral cases leads rapidly to death. In the unilateral cases, the prognosis, if not quite so serious, is still very discouraging, showing only about 24% of cures.

Pathological Conditions of the Kidney Considered Roentgenologically. B. H. NICHOLS, Cleveland. *Southern Medical Journal,* January, 1926.

(1) In making a roentgenogram both kidneys with the adjacent structures should always be included in order to determine their relative size, shape and position.

(2) A pathological condition can be determined only when definite deviations from the normal are present.

(3) It must always be borne in mind that a large kidney may be merely a compensatory hypertrophy and that the small kidney on the opposite side is the pathological kidney.

(4) To determine the presence of a nephroptosis roentgenograms should always be taken with the patient in both the upright and the supine position.

(5) In all cases which present a history which leads one to suspect stones, if no shadows appear in the primary examination, a pyelogram should be made.

(6) A pyelitis should be suspected in cases in which the calyces are dilated and flattened and the pelvis contracted.

(7) The ostrich plume deformity of the dilated or destroyed kidney tissue should suggest the probability of a tuberculous infection.

(8) The presence of infection in a hydronephrotic kidney cannot be determined by roentgen ray examination, since in many cases no appreciable destruction of kidney tissue has taken place.

(9) A perinephritic abscess may often be detected from the pyelogram as the draining of the abscess into the ureter or the pelvis shows the fistulae filled with the pyelographic media.

(10) The usual tumor of the kidney is hypernephroma. It cannot be differentiated from carcinoma, sarcoma and malignant adenoma, which, however, are rarely found in the kidney. The possibility of a metastasis should be determined by a roentgenogram of the skull and long bones.

(11) When a pathological condition exists in the kidney it is important to determine whether or not an anomaly is present. The anomalies most frequently found are (a) the solitary kidney; (b) the rudimentary kidney; (c) the horse-shoe kidney; and (d) the duplex kidney, one portion of which may be diseased and the other normal.

Pyelographic Findings in Pyelitis Complicating Pregnancy. JOHN T. WILLIAMS, Boston, Mass. *American Journal of Obstetrics and Gynecology,* December, 1925.

The importance of the facts brought out by this study lies in a proper conception of pyelitis during pregnancy

not as a condition due directly to the pregnancy but as, in the majority of cases at least, a chronic preexisting condition brought to a state of acute activity by the pregnancy, and not to be dismissed without further consideration after the pregnancy has terminated. The mechanism of the attacks of pyelitis during pregnancy appears to be as follows: a prolapsed kidney with dilated pelvis, with or without a kinked ureter; additional strain upon the excretory apparatus during pregnancy with later some ureteral compression by the fetal head; urinary stasis; infection with the bacillus coli; recovery from acute symptoms after drainage is secured by ureteral catheterization or the end of the pregnancy; but persistence of the original conditions which predisposed to the acute attack leaving the way open to further trouble.

Urethral Diverticula. HUGH H. YOUNG and E. CLAY SHAW, Miami Beach, Fla. *Southern Medical Journal,* January, 1926.

A case here described is the first instance reported in which a diverticulum formed along the track of a fistula following perineal prostatectomy. There are apparently only two additional cases in the literature which have followed perineal operations (seminal vesiculotomy and perineal lithotomy). Two cases following a bullet wound and ruptured abscess were reported by Bumpus. No description of an operation for such cases has been found. All other cases of urethral diverticula in the literature were apparently of the bulbous or anterior urethra, these being the only cases connecting with the prostatic urethra. In the case described no difficulty was experienced in enucleating the paper-thin sac and excising the large gourd-like fistula *in toto* enclosing the urethral opening.

Attenuated Bone Infections. Considerations in the Treatment of Osteomyelitis. WALTER M. BRICKNER, New York. *The Journal of the A. M. A.,* December 5, 1925.

The phenomenon of attenuation and longevity of pyogenic bacteria in the bones, is illustrated in the chronic bone abscess, and is to be observed in other latent local and metastatic foci of osteomyelitis. In these conditions, especially, it affords opportunities for conservative surgery—drill drainage of nonperforating chronic bone abscesses, incision of subperiosteal abscesses, simple sequestrectomy. The important pathologic process in chronic osteomyelitis is bone necrosis. There is a definite causal relationship between this necrosis and suppuration. When necrosed bone escapes or is removed, the suppuration usually ceases. Two important principles apply in the surgery of chronic osteomyelitis: First, the bone itself should not be attacked until a sequestrum has definitely formed. Second, the simple removal of sequestrums may be all that is necessary to effect healing, in spite of overhanging healthy bone. As a rule, simple sequestrectomy should serve as a primary operation. The shallow bone trough may be required to effect definitive healing, but plastic osteotomy may be wisely deferred until its necessity and extent are definitely indicated. Osteotomy cannot be applied in all situations to eradicate bone cavities, which, however, sometimes close up or close over spontaneously. For an indolent cavity, surrounded by a wall of dense bone, the drilling of small holes through that wall is suggested. In acute osteomyelitis, extensive gutter osteotomy is not necessary, and scraping out the cancellous bone is to be severely condemned. Drainage can be provided through drill holes (trephinage) of sufficient size and number, or through bipolar trephinage; and suppurating medullaris may be adequately evacuated with gauze wipes or irrigation, or may be left to drain out. Chronic bone abscesses may be medullary or cortical, may be at any level of the bone, and are rarely tuberculous. Their symptoms are pain and bone tenderness, occasionally slight fever. Chronic bone abscesses are usually residual from, and give symptoms years after, acute osteomyelitis. There is illustrated, however, a series of solitary, chronic, sterile, cortical abscesses without any discovered antecedent infection. Nonperforating chronic bone abscesses are usually sterile or nearly so. Osteotomy is therefore not necessary for their cure. Brickner's method of treatment by simple evacuation through a small drill hole has been uniformly successful, in his experience, even in nonsterile cases.

Amputation Below the Knee in Spontaneous Gangrene. (*Unterschenkelamputation bei Spontangangrän*) I. EISENKLAM, Vienna. *Weiner Klinische Wochenschrift,* December 3, 1925.

The author observes that it has been customary in this clinic to treat spontaneous gangrene as conservatively as possible. Amputations above the knee are undertaken only because of rapidly progressive infection with evidences of sepsis, rapidly progressing gangrene, or in cases of gangrene above the toes in which the general condition of the patient precludes the possibility of his withstanding a reamputation, if necessary.

In cases where gangrene of a toe has become demarcated, an attempt is made merely to exarticulate this toe. Otherwise, except in the presence of the indications above mentioned, amputation below the knee is preferred.

However, the author advises that certain points in the technic of amputation be particularly observed. First, no tourniquet is to be applied because of the danger of further injuring already diseased vessels and thus completely compromising the circulation. The simple circular amputation described by Kausch is employed. No attempt is made at closing the wound primarily, though sutures are placed, which may be used either for secondary suture or as a means of traction in case the skin edges have retracted. The application of the wound dressings requires the utmost attention to prevent the slightest pressure or the retention of blood or wound secretion.

Amputations below the knee may result in the necessity for reamputation, and always occasion a longer period of healing than amputations above the knee. However, the author feels that the necessity for reamputation because of progressing gangrene is slight, and the operation below the knee is not therefore to be discredited.

Cuneiform Osteotomy (*L'osteomotie cuneiforme*). F. M. CADENAT, Paris. *Archives Franco-Belges de Chirurgie,* Vol. XVIII, No. 7, 1925.

In this very interesting contribution, Cadenat presents a review of the conditions of the lower leg in which cuneiform osteotomy is indicated. Flexion deformity of the knee, genu valgum or recurvatum deformities of marked degree, are depicted, both before and after successful operations.

The author has devised a goniometer, by the application of which he is able to determine with great accuracy the exact extent of the cuneiform osteotomy. He has shown that the angle of correction to be employed is exactly equal to the angle of maximum deviation, and he gives accurate instructions for the method of determining this angle of maximum deviation roentgenographically.

Incomplete Rupture of the Crucial Ligaments. (*La rupture incomplete des ligamentes croises*). JEAN VERBRUGGE et JOSE VALLS, Antwerp. *Archives Franco-Belges de Chirurgie,* Vol XVIII, No. 6, 1925.

Incomplete ruptures of the crucial ligaments are rather rare. Only six other cases have been reported. The anterior ligament is almost exclusively the one involved. The patient complained of a feeling of insecurity in walking after a severe injury. There were lateral, rotational and antero-posterior abnormal mobility. The patient was operated on by the procedure described by Hey-Groves and made a completely uneventful recovery, following a 24-hour period of immobilization. Four weeks after operation he was able to flex the knee to 105° and extend it to about 170°. Seen eight weeks

after operation, he reported himself completely well. The author reviews the six cases previously described, and gives a slight bibliography of the subject.

Correction of Angulation of Fractures. (*Correction de l'angulation des fractures*). F. GENTIL et RAYMOND BONNEAU. *Archives Franco-Belges de Chirurgie*, Vol. 28, No. 7, 1925.

The author describes a method of overcoming angulation in fractures, especially of the femur, where simple traction does not accomplish this end. He passes a wire beneath the bone and by direct traction from a fixed support on the extension apparatus itself corrects the deformity. In recent compound fractures, he inserts the wire immediately after débriding the wound. In old compound fractures, where the poor position or condition of the fractured bone ends themselves is the cause of trouble, the author does not hesitate to undertake the insertion of the wire even in the presence of fever. In closed fractures, it is advisable to wait 7 or 8 days before attempting to open the fractured limb for the insertion of the wire. If the wound is infected, the wire is still kept in place but Dakinisation is instituted. A number of illustrative cases are reported with good line drawings to exemplify the text.

The Use of the Sea Sponge as a Surgical Dressing. JOHN STAIGE DAVIS and HERBERT F. TRAUT, Baltimore. *Archives of Surgery*, December, 1925.

The sea sponge is easy to obtain and can be sterilized without difficulty. It can be applied under considerable pressure that is elastic, even and continuous, with little danger of a pressure slough. It minimizes congestion in flaps and grafts. By its use, dead spaces are eliminated. It stays moist long enough to absorb any blood or serum that may ooze from the wound. It does not irritate or macerate the skin even after being in place for weeks.

The moist sea sponge, under pressure, fits into depressions and over uneven surfaces very accurately; when it dries, it forms a perfect mold of the surface and absolutely splints and immobilizes the area over which it is applied. It is particularly valuable as a dressing after plastic operations of various kinds and for skin grafts, especially of the whole thickness variety. In addition, on wounds requiring even pressure and immobilization on all parts of the body, it is a most valuable surgical dressing.

Book Reviews

A Textbook of Operative Orthopedics. By A. STEINDLER, M.D., F.A.C.S., Professor of Orthopedic Surgery, State University of Iowa. Octavo; 403 pages; illustrated. New York and London: D. APPLETON AND COMPANY, 1925.

We regard this as being conspicuously among the most useful surgical books published during the past year. Professor Steindler—indefatigable worker and thorough student—has done a great service in thus bringing together into a well written volume a description of the accepted and acceptable operations of orthopedics. His purpose has been "to establish selections and to draw limitations", and he has made his selections wisely and with well balanced judgment and sound critique. He has evidently searched the literature thoroughly and appears to have omitted no important, worthy operation.

The purpose, the rationale, the technique, the advantages and disadvantages of each operation are described, and, for many of them the results are considered statistically or otherwise.

Of the illustrations a few are half-tones but most are line drawings made from original sources. These are sufficiently clear but are not attractive. They are not interpolated in the text to which they belong, but are grouped together on 83 full-page plates. This is not a convenient or a pleasing arrangement; and, too, it is a bit confusing.

The Index to Authors is also not a good arrangement, we think. The numbers opposite the names of authors is not of pages but of bibliographic references. These references are at the end of each chapter on pages to which there is no index. One must therefore search through the book for the reference number, and then glance through the preceding chapter to find the page on which the author's operation, technique or results are mentioned. Surely a simple page reference would have been much better. The fault is not atoned by the Subject Index for here many operations are not listed by the name of their author.

In every well selected collection of modern orthopedic works in English this book will have a place; and we doubt that any of its companions in the collection will be referred to more often or with more satisfaction.

Some Fundamental Considerations in the Treatment of Empyema Thoracis. By EVARTS A. GRAHAM, A.B., M.D., Member of Empyema Commission, U. S. Army; Professor of Surgery, Washington University School of Medicine; Surgeon-in-Chief, Barnes Hospital and St. Louis Children's Hospital. Octavo; 110 pages; illustrated. St. Louis: THE C. V. MOSBY COMPANY, 1925.

Professor Graham was one of the Empyema Commission appointed by the Surgeon General of the Army in 1918 to study that common and often fatal complication of the epidemic of hemolytic streptococcus pulmonary infection (so-called "flu") which was ravaging our camps. The essay that described his clinical and experimental observations at that time won the Samuel D. Gross Prize of the Philadelphia Academy of Surgery in 1920; and this small book is the belated printing of that prize essay, as required by the terms of the award. It is quite unnecessary to review its contents for they are already familiar through publications of Graham and of others. The teachings of the Commission, which reduced the mortality of acute empyema from a very high to a very low figure, are easily summarized: avoidance of open pneumothorax in the acute stage; rapid sterilization and obliteration of the cavity (Dakinization); close attention to maintenance of the patient's nutrition.

An addendum to the essay is devoted to a discussion of certain observations concerning pneumothorax in which other authors have differed with Graham's conclusions from dog experiments.

Pitfalls of Surgery. By HAROLD BURROWS, C.B.E., M.B., B. S. (Lond.), F.R.C.S.; Surgeon at the Gosport War Memorial Hospital; Assistant Surgeon at the Royal Portsmouth Hospital; etc. *Second Edition.* Octavo; 525 pages. New York: WILLIAM WOOD AND COMPANY, 1925.

There is little for us to add to our review of the first edition of this book, then titled Mistakes and Accidents of Surgery (The JOURNAL, July, 1923, p. 184). The "pitfalls" here set forth are a collection of mischances that actually befell. They make exceedingly interesting as well as profitable reading not only for the novitiate in surgery, for whom they will be most valuable, but also for the ripened surgeon who will no doubt encounter herein some experiences that are new to him.

The Radiological Examination of the Male Urethra. By G. L. S. KOHNSTAM, M.R.C.S., (Eng.), L.R.C.P. (Lond.); Late House Surgeon to the Urological Department, King's College Hospital, London; and E. H. P. CAVE, M.B., B.S. (Lond.), M.R.C.S. (Eng.), L.R.C.P. (Lond.), D.M.R.E. (Camb.); Late Resident Radiologist, Kings College Hospital, London. Octavo; 115 pages; 64 figures. New York: WILLIAM WOOD AND COMPANY, 1925.

The diagnostics of the upper urinary tract have been much developed by roentgenography with radio-opaque substances, and we are familiar with examination of the bladder by the same method and by pneumo-roentgenography. This small monograph represents the original work of its authors in elaborating a method of roentgenography of the male urethra. They use for the purpose undiluted lipiodol, which they found the most satisfactory opaque medium, and they

have evolved a technique for its injection and for the exposures.

The procedure has disclosed some interesting findings, and suggests a method of investigation that offers a promise of useful development. Especially, it seems to us, it affords a means of studying some of the anatomic and physiologic effects of prostatectomy. Several pictures deal with this phase. The procedure appears to be of value in determining the extent and character of certain strictures and, as the authors state, it affords a diagnostic aid in cases in which instrumentation is impossible or contraindicated. As Thomson-Walker states in his foreword, however, the method is subordinate in importance to urethroscopy and cystoscopy. Of more than passing interest is the finding that fluid injected at the meatus may find its way into the seminal vesicles. It serves as a warning against irrigations under pressure.

We would criticize the absence of legends under the pictures; one must turn to the text to learn what they show. We also criticize the inexcusable, persistent, but not uniform, capitalization of anatomical terms and of many adjectives. Thus we read (page 64): "Internal urethrotomy", "A Peri-urethral abscess", "the Perineum", "the Urethrogram", "the Peno-scrotal curve", "the Bladder base". The publisher should have known better than this, even if the authors did not.

Aids to Surgical Diagnosis. By CECIL P. G. WAKELEY, F.R.C.S. Assistant Surgeon and Teacher of Clinical Surgery, King's College Hospital. Duodecimo; 170 pages. New York. WILLIAM WOOD AND CO., 1925.

This little volume is one of a series of student's aids. It makes no pretense at being anything more than a mere outline of surgical diagnosis. As such, it is clear, concise and should be of value as a pocket manual.

La Haute Fréquence en Oto-Rhino-Larynologie. Par LEROUX-ROBERT, ancien assistant d'oto-rhino-larynologie de la Salpètriere. Preface du PROFESSOR D'ARSONVAL. Octavo; 166 pages; 74 figures. Paris: MASSON ET CIE., 1925.

In this rather well written and extremely well illustrated little monograph Leroux-Robert details the results of his observations, his instrumentarium, and the technique to be employed in the application of high frequency current in oto-rhino-laryngology. Several chapters are devoted to a technical consideration of the type of instrument to be used, the character of the current generated and its effect on the tissues.

In considering the high frequency current, the author points out that the use of diathermia may be considered a sort of medical application, while the use of the diathermia for coagulation and fulguration may be considered in the light of surgical applications. The work is consequently divided into two main parts, which treat of the medical and surgical indications for the application of the high frequency current. Each chapter is preceded by a discussion of the physiologic and therapeutic principles involved, with a careful statement of the indication and the technique to be employed in the various pathological conditions of the nose, ear and throat.

Diagnostische und Therapeutische Irrtümer und deren Verhüting. Chirurgie. Herausgegeben von PROF J. SCHWALBE, Berlin. *Heft. 7 Verletzungen und chirurgische Krankheiten der Mund- und Rachenhöhle, des Halses, der Speiseröhre, des Kehlkopfes und der Trachea.* Von PROF. PAUL CLAIRMONT, Zurich. Octavo; 188 Seiten; 97 Abbildungen. Leipzig: GEORG THIEME, 1926.

This booklet constitutes the seventh of a series of twelve devoted to a consideration of the more common diagnostic and therapeutic errors in surgery. The whole work is extremely practical and presents for consideration the problems that every surgeon is called upon to meet day by day. No attempt is made at presenting a systematic treatise of surgery and yet, taken as a whole, the work is an excellent text-book of differential diagnosis. Operative procedures are not discussed at all and only the operative indications and the main objects of the operative interference are indicated. A relatively large chapter is devoted to the treatment and diagnosis of diseases of the thyroid. The volume is, like all the others of the series, intensely interesting, well written and profusely illustrated.

Diagnostische und Therapeutische Irrtümer und deren Verhütung. Chirurgie. Herausgegeben von PROF. DR. J. SCHWALBE, Berlin. *Heft* 10. *Chirurgische Erkrankungen und Verletzungen der Harnorgane,* von PROF. DR. VOELCKER, Halle, und PROF. DR. LEDDERHOSE, München. *Chirurgische Erkankungen und Verletzungen der männlichen Geschlechtsorgane,* von PROF. DR. PELS LEUSDEN, Greifswald. Oktavo; 136 Seiten; 12 Abbildungen. Leipsic: GEORG THIEME, 1925.

This small pamphlet is one of a great number which have been published under the editorial supervision of Prof. Schwalbe. Taken together, they will constitute an excellent volume on the differential diagnosis of the various surgical conditions as well as a surgical vade mecum in the avoidance of therapeutic errors. The several divisions of the subject are discussed by recognized authorities in their respective fields.

Progressive Medicine, a Quarterly Digest of Advances, Discoveries and Improvements, in the Medical and Surgical Sciences. Edited by HOBART AMORY HARE, M.D., LL.D., assisted by LEIGHTON F. APPLEMAN, M.D. *Volume III. September,* 1925. *Volume IV. December,* 1925. Philadelphia: LEA AND FEBIGER.

The September number includes: Obstetrics, by George Gellhorn; Dermatology and Syphilis, by Jay F. Schamberg; Diseases of the Nervous System, by William G. Spiller; Diseases of the Heart and Bloodvessels, by O. H. Perry; Diseases of the Bronchi, Lungs, Pleura and Diaphragm, by H. R. M. Landis.

The December number deals with reviews of the literature of: Diseases of the Digestive Tract, the Liver, Pancreas and Peritoneum, by Martin Rehfuss; Diseases of the Kidneys, by Nelson K. Fromm; Genito-Urinary Diseases, by Charles W. Bonney, Surgery of the Extremities, Shock, Anesthesia, Infection, Fractures, Dislocations and Tumors, by Walter Estell Lee; and Therapeutic Advances by H. R. M. Landis. These critical and collective reviews are, as usual, most interesting. Lee's section deals with many subjects of general surgical interest not mentioned in the title, e.g., post-operative massive collapse of the lung, tetanus, transfusion, etc.

The Medical Follies. By MORRIS FISHBEIN, M.D., Editor of *The Journal of the American Medical Association.* Duodecimo; 223 pages. New York: BONI & LIVERIGHT, 1925.

These essays, largely reprinted, bring up to date and revamp for our generation the ever interesting subject of current and earlier medical frauds and foibles.

Holmes in his famous "Homeopathy and Kindred Delusions" covered much the same field but was less trenchant than our author.

No one in America is better qualified for the task than the distinguished editor of *The Journal of the American Medical Association.* With delicate touches and with piercing sarcasm he passes from Osteopathy to Abrams, to Birth Control and at last to the chapter on the Science of Healing. This gem on page 26 is in the essay on Elisha Perkins. ".....A horse is, after all, a piece of property and not to be compared with a child or a wife or any other foolish human being."

A profound rebuke to the materialistic fatalism of a medicine dominated by the dead house, may be gleaned from this final quotation from Paracelsus. "Never must the physician say, the disease is incurable. By that admission he denies God, our Creator; he doubts Nature with her profuseness of hidden powers and mysteries."

Every medical man will find himself better poised, by the reading of this book. He will enjoy the sly fun and the wisdom between its covers. He may even have the courage to pass it on to his patients for their profit and delectation.